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Keywords: alarms, cardiac monitor, monitor, physiologic monitor

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I. OBJECTIVES

The purpose of this policy is to standardize the approach to:


1. Initiate and maintain bedside cardiac and physiologic monitoring;
2. Set and respond to cardiac and physiologic monitor alarms;
3. Ensure staff proficiency with cardiac and physiologic monitors;
4. Manage monitor and secondary device outage issues.

II. INDICATIONS FOR USE


This policy shall be implemented for any patient who requires cardiac and physiologic monitoring at The Johns Hopkins Hospital.

III. DEFINITIONS

Cardiac and Physiologic Monitoring	Assessing parameters which may include but are not limited to heart rate (HR), blood pressure (BP), temperature (T), oxygen (O ₂) saturation, respiratory rate (RR), and cardiac rhythm.
Alarm Levels	<ol style="list-style-type: none"> 1. Monitor alarms are divided into two classifications: <ol style="list-style-type: none"> a. Patient Status Alarms b. System (Technical) Alarms 2. Within each classification, there are levels that correlate to the severity of the alarm causing condition.

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Patient Status Alarms	<ol style="list-style-type: none"> 1. Alarm (dysrhythmia or parameter) triggered by a patient condition that is caused by a dysrhythmia or violates a parameter limit/threshold. 2. Unit alarm default parameters are preset by the nursing unit and clinical engineering*. (Clinical Engineering maintains a list of current unit monitor default settings). 3. Preset monitor alarm levels include: <ol style="list-style-type: none"> a. Crisis: 3 audible beeps continuously occurs while condition exists, displayed as flashing text, stored in alarm history, auto prints (if the feature has been enabled). This alarm must be manually reset. b. Warning: 2 audible beeps continuously occurs while condition exists, displayed as flashing text that is stored in the alarm history and auto prints (if enabled) and auto resets when the condition subsides. c. Advisory: 1 audible beep continuously occurs while condition exists, displayed as a flashing text, stored in the alarm history and auto resets when the condition subsides. d. Message: non-audible alert displayed as flashing text while condition exists and auto resets when the condition subsides. <p>* Note: Prior to installation on the unit, and after discussion with the Nursing and Medical Leadership, Clinical Engineering shall customize the alarm levels and parameter defaults to meet the needs of the unit. The Alarm Management Committee provides guidance on unit selection of alarm defaults. VT/VF and asystole are always categorized as crisis alarms and cannot be changed.</p>
System (Technical) Alarms	<p>Alarm triggered by a mechanical or electrical problem.</p> <ol style="list-style-type: none"> a. System warning: A continuous foghorn sound, flashing text which auto resets when the condition subsides. b. System advisory: A single foghorn sound and flashing text which auto resets when the condition subsides.
Threshold Limit	Limit for each monitored function which, if equal to or exceeds the limit, will trigger an alarm.
Telemetry	Cardiac monitor box connected to the patient that transmits a cardiac signal to the CIC where it is displayed and monitored. This allows the patient to move freely without being tethered to the bedside monitor.
CIC	Central Information Center; also known as the central monitoring station.
Globestar Connexall Middleware	Software that enables alarms to be sent via multiple modalities (e.g., pager, phone, waveform screen) using an alarm escalation scheme.
Alarm Escalation	Path an alarm travels using a predefined algorithm (See Appendix A Section J for Sample Alarm Delay and Escalation Schemes)
Primary Alarm Notification System	Bedside or central physiologic monitor that emits an alarm.

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Secondary Alarm Notification System	<p>Auxiliary alarm notification device used to communicate alarms from the bedside or central physiologic monitor.</p> <p>Types of Secondary Alarm Notification Systems (See Appendix A):</p> <ol style="list-style-type: none"> Auto View on Alarm (AVOA) -A split screen function that may be enabled on the bedside monitor which allows select alarms to be transmitted to designated bedside monitors. Video monitor- Waveform screen located in various areas of the unit; may emit audible alarms if enabled. Acknowledgement pager - Wireless device that receives alarms and text messages from the physiologic monitor via the middleware. Alarms may be acknowledged or escalated to another designated staff member. ASCOM Wi-Fi phone-Wireless device that receives alarms and text messages via the middleware and allows voice communication. Alarms may be acknowledged or escalated to another designated staff member. Monitor Watch - Technician or another trained individual who is assigned to observe monitors and sends alarm information to designated staff members.
Continuous Cardiac and Respiratory Monitoring (Appendix B)	Describes the monitoring level ordered by the authorized prescriber for patients requiring continuous monitoring. Patients ordered for continuous monitoring must be on a monitor at all times, including during transportation. Refer to PAT007 Transport of Patients, Intra-Facility .
Intermittent Cardiac or Respiratory Monitoring (Appendix B)	Describes monitoring that is not continuously used to guide therapy or make a diagnosis. With intermittent cardiac monitoring the patient does not require monitoring during transport off the unit. In pediatrics, conditions for intermittent monitoring must be defined by the authorized prescriber (e.g. continuous pulse oximetry with sleep).

IV. RESPONSIBILITY


- Authorized Prescriber:
 - Orders continuous or intermittent cardiac monitoring, including the parameters to be notified.
 - Discontinues monitoring when it is no longer indicated.
- Patient's Assigned Nurse
 - Evaluates physiologic monitoring alarms and responding as indicated.
 - Staff will be signed off on the monitor skills proficiency list or other validation method per unit standard by his/her preceptor prior to assuming accountability for monitoring. (See [Cardiac Monitor Proficiency Skills List](#)).
 - Only nurses who have passed a dysrhythmia knowledge assessment with a score of 85 % or more shall be responsible for cardiac and physiologic monitoring and/or alarm notification conditions.
 - Mandatory questions that require a score of 100% include the questions pertaining to VT and VF.
 - Pediatric nurses are not required to pass a dysrhythmia knowledge assessment and instead must demonstrate knowledge of dysrhythmias specific to pediatric population which is verified through the orientation educational process.

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2. Customizes (individualizes) the bedside cardiac and physiologic monitor to ensure that appropriate alarm limits and levels are set on admission, and are checked and reviewed at the start of every shift, and as needed throughout the shift. Alarm adjustments may be necessary when the patient's condition changes or to minimize the frequency of clinically insignificant alarms.
 3. Initiates cardio-respiratory monitoring in an emergency. An authorized prescriber's order is needed to discontinue monitoring.
 4. Delegates appropriate tasks to Unlicensed Assistive Personnel (UAP) per the job-related skills proficiency list.
- C. Transport Team: *(for patients transported on continuous monitoring)*
1. Conducts transports off the unit using portable transport equipment.
 2. Adheres to transportation requirements per [PAT007 Transport of Patients, Intra-Facility](#).
 3. Cardiac monitoring shall continue throughout the testing procedure.
- D. Unlicensed Assistive Personnel (UAP)
1. For UAPs working with adult patients, Clinical Technicians (Clin T) and Clinical Nursing Externs (CNE) may respond to dysrhythmia alarm notification as delegated by the RN and if permitted by unit standards once they have demonstrated proficiency by passing the dysrhythmia knowledge assessment with a score of 85 % or greater.
 - a. Mandatory questions that require a score of 100% include the questions pertaining to VT and VF.
 2. In Pediatrics, Clinical Technicians (Clin T) and Clinical Nursing Externs (CNE) shall notify the RN of alarm notification.
- E. Clinical Engineering Service
1. Responds to reports of unresolved electrical interference or other technical issues or outages related to cardiac and physiologic monitoring and dysrhythmia pagers.
 2. Makes adjustments to unit default settings as needed and after discussion with the Alarm Management Committee chairperson(s) and approval of unit medical and nursing leadership.
 3. Maintains a current list of unit monitor default settings for the all monitored units.
- F. Alarm Management Committee
1. Reviews and revises the Cardiac and Physiologic Monitor Policy every three years and as needed.
 2. Establishes the standard for monitor alarm management and secondary alarm notification options. Reviews requests to change to unit default settings, as needed.

V. PROCEDURE


- A. General Information:
1. Monitor alarm default parameters are set by the unit or departmental medical and nursing leadership after discussion with the Alarm Management Committee Chairperson(s). Refer to [MEL024 Clinical Alarm Policy](#) for additional information on requesting changes to default parameter settings.
 2. Leadwires:
 - a. For units using disposable leadwires, send leadwires with patient upon transfer to another monitored unit.
 - b. For unit using reusable leadwires, inspect the leadwires for cracks or other damage and replace leadwires that are cracked, damaged, or no longer flexible.
- B. Monitor Initiation and Maintenance Procedure:
1. Follow Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures.
 2. Patients may be ordered for continuous or intermittent cardiac monitoring. See Appendix B: Adult Cardiac Telemetry Monitor Initiation and Discontinuation Criteria.

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- a. Patients ordered for continuous monitoring must remain on the monitor at all times. If it is necessary to take the patient off the monitor (example: shower, bath), there must be an authorized prescriber order and a competent healthcare provider (BLS trained) in the room with the patient.
- b. Patient ordered for intermittent monitoring will be evaluated regularly for the need to remain on cardiac monitoring. Patient on intermittent monitoring may be transported without the monitor.
3. Entering patient information into the CIC or bedside monitor:
 - a. For monitors with an electronic cardiac monitor interface to enter patient data, the patient's nurse/designee selects the correct patient from the populated census list. Name and history number information will be automatically brought over to the bedside monitor in the proper sequence.
 - b. For monitors without an electronic cardiac monitor interface, the patient's nurse/designee enter patient data follow the steps below:
 - i. DO NOT enter the check digit (the leading first digit before the seven-digit medical record number) of the medical record number. Enter two zeroes prior to entering the medical record number (example: 001234567). DO NOT use hyphens or blanks.
4. The patient's assigned nurse shall review the monitor alarm limits (e.g., HR, BP) and levels (e.g., crisis, warning, advisory or message) to ensure that these are appropriately set on admission, at the beginning of the shift and as needed throughout the shift. The nurse shall confirm that the values obtained by the monitor are consistent with the patient assessment. See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures.
5. The patient's assigned nurse monitors the patient's hemodynamic status during rate and rhythm or if dysrhythmias occur, assessing the patient's blood pressure and tissue perfusion as needed (e.g., level of consciousness, O2 sat, capillary refill, and peripheral pulses).
- C. Alarm Notification: See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures
 1. The primary alarm notification system is the CIC or bedside monitor. Alarm notification through other means is considered secondary alarm notification. See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures for types of secondary alarm notification methods. Units must use at least one secondary alarm notification method to enhance alarm audibility.
- D. Response to Alarms: (See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures).
- E. Alarm Volumes: (See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures).
- F. Alarm History:
 1. The nurse shall check the patient's alarm history with each patient assessment to identify patient trends in dysrhythmias and other parameters.
 - a. The bedside monitor allows 36 dysrhythmia alarms (advisory or higher) to be viewed.
 - b. The central monitor (CIC) allows the last 100 telemetry dysrhythmia alarms (advisory or higher) to be viewed and the last 36 hardwire dysrhythmia alarms (advisory or higher) to be viewed. Secondary alarm notification is used to enhance alarm audibility.
- G. Telemetry
 1. Evaluate the need for continuation of telemetry daily. See Appendix B: Adult Cardiac Telemetry Monitor Initiation and Discontinuation Criteria.
 2. Telemetry has a limited range which requires patients to stay within certain areas.
 3. Electromagnetic Interference

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- a. Due to potential electromagnetic interference, healthcare providers are advised to refrain from using cellular connecting devices, e.g. phones, smart phones, laptops or tablet PCs within 3 feet of a telemetry transmitter. Wi-Fi connected wireless laptops or tablet PCs are acceptable because the power output is significantly lower and the operating frequency higher than a cellular system making interference unlikely.
- b. Patients on telemetry and their families and visitors shall be advised by nursing staff to refrain from using cellular connecting devices e.g. phones, smart phones, laptops or tablet PCs within 3 feet of a telemetry transmitter.
- c. Hand-held radio frequency (RF) transmitters (e.g., walkie/talkie) shall not be used within 10 feet of critical electronic medical devices. Refer to [HSE016 Portable/Hand-Held Radio Frequency Transmitters](#) policy.
4. Telemetry transmitter batteries shall be changed:
 - a. Upon initiation of telemetry;
 - b. When the low battery indicator light appears on the monitor;
 - c. When a system warning alarm occurs indicating a low battery.
5. The lead wire serves as part of the antenna and must be kept clean and intact.
- H. Patient Transport off the Unit
 1. Transports shall be conducted within the guidelines of [PAT007 Transport of Patients, Intra-Facility](#).
 2. Monitoring status should not be altered for the sole purpose of facilitating transport (See [PAT007 Transport of Patients, Intra-Facility](#))
 3. For units with transport monitors that use a TRAM or PDM:
 - a. If the patient is on telemetry, connect to hardwire:
 - i. Attach the transport monitor cord to the patient's bedside monitor TRAM and make sure the transport monitor is on and functioning, before disconnecting the monitor TRAM module.
 - ii. This step is necessary to retain the set alarm limits and parameters. Place TRAM in transport monitor
 - iii. Upon the patient's return to the unit, reinsert the TRAM or PDN into the patient's bedside monitor, if applicable, or place patient back on telemetry if no bedside monitor. The alarm parameters and limits must be rechecked to ensure that they are set correctly.
- I. Patient Teaching (See Patient Education Manual: [MISC001 Wireless Communication Devices on Telemetry Units, Appendix A](#))
 1. Explain to patient, family, caretaker, and/or significant other that monitor artifacts or patient movements can trigger irrelevant alarm signals.
 2. Instruct the patient and or family to notify the nurse if the patient has chest pain, rapid or skipped heart beats, dizziness, SOB and/or a change in level of consciousness.
 3. Instruct the patient on:
 - a. The range of telemetry, if applicable.
 - b. The restriction of cell phone and wireless usage.
 - c. That they are never to disconnect the monitor wires for any reason.
- J. Monitor or Secondary Device Malfunction: (See Appendix C: Physiologic Cardiac Monitor and Secondary Device Outage Plan.
- K. Alarm Troubleshooting (See Appendix A: Cardiac and Physiologic Monitor Electrode and Lead Placement, Alarm Management and Troubleshooting Procedures).
- L. Guidelines for Unit-based Monitor Watch (See Appendix D).

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VI. DOCUMENTATION

- A. For adult patients, a printed rhythm strip shall be inserted on the ECG Observation Form and documented in the electronic medical record identifying PR, and QRS, rate and rhythm interpretation, date and time. This shall occur on admission, each day the patient is monitored, and for assessment of significant rate and rhythm changes and for new onset dysrhythmias.
- B. Document implementation of the cardiac monitor policy and verification of alarm settings at the beginning of each shift.
- C. Pediatric patients ordered for continuous monitoring shall have vital signs documented on admission and every 4 hours, or more frequently per unit standards.
- D. Any lethal dysrhythmias or changes in rhythm shall be documented in the electronic medical record by the patient's RN or designee. A printed rhythm strip shall be inserted on the ECG Observation Form. In addition, any treatments, and response to interventions shall be documented.

VII. REPORTABLE CONDITIONS

- A. Notify the authorized prescriber for:
 1. Alarm parameters consistently outside of the predetermined/ordered alarm limits.
 2. New onset dysrhythmias and/or chest pain/angina or equivalent.
 3. Changes in hemodynamic status related to new onset dysrhythmias.
 4. ICD firing.
 5. Pacemakers malfunction.
- B. Report monitor, middleware or clinical communication device (e.g. phone, pager, waveform screen) problems to 5-HELP.
- C. If a patient event occurs related to cardiac or physiologic monitoring;
 1. Report patient event related to alarm management in event reporting system.
 2. Obtain a rhythm strip for patient prior to event and put in medical record.
 3. Notify CES on-call person for direction on CIC and TRAM management.
 4. If within 72 hours of the event and patient has not been discharged, review "Full Disclosure" for event detail.


VIII. EDUCATION AND COMMUNICATION

This policy shall be communicated to the appropriate JHH personnel via the following channels:

1. The policy shall be distributed to the Chairs of Medical Staff, Physician Advisors, and the relevant Department of Nursing Committees.
2. Notification of policy changes shall be sent to training program directors, physician advisors and department chiefs of service.
3. Updates and revisions shall be communicated via Medical Staff and Nursing publications.
4. This policy shall be placed in the [Interdisciplinary Clinical Practice Manual](#) on the JHH Policy website. In the event of web access difficulty, the policy can be obtained from the downtime computer on any clinical nursing unit.

Educational Resources:

1. [Guidelines for Use of the Physiologic Monitor Arrhythmia Pager](#)

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IX. SUPPORTIVE INFORMATION

See Also:

The Johns Hopkins Hospital, Nursing Practice and Organization Manual Vol II

- [CC602 Arterial Line, Management of the Patient with...](#)
- [CC638 Increased Intracranial Pressure, Nursing Management of the Patient with](#)
- [CC644 Pacemaker, Management of the Patient with Temporary Transvenous/Epicardial](#)
- [CC655 Pulmonary Artery Catheter, Management of the Patient with](#)
- [Mosby009 Pulse Oximetry Procedure](#)

The Johns Hopkins Hospital, Interdisciplinary Clinical Practice Manual

- [PAT004 Cardiopulmonary Resuscitation \(Arrest/Code\) and Rapid Response Teams](#)
- [PAT007 Transport of Patients, Intra-Facility](#)
- [PAT030 Intravenous Push \(IV PUSH\) Medications, Adult](#)

The Johns Hopkins Hospital, Medical Nursing Standards of Care Manual

- [GM127 Dofetilide \(Tikosyn\), Management of the Adult Patient Requiring](#)

The Johns Hopkins Hospital, Children's Center Pediatric Policies, Procedures and Protocols

- [NICU042 Pulse Oximetry](#)

Hospital Safety and Environmental Health Manual


- [HSE016 Portable/Hand-Held Radio Frequency Transmitters](#)

The Johns Hopkins Hospital, Patient Education Manual

- [MISC001 Wireless Communication Devices on Telemetry Units](#)

References:

1. Chambrin, M.C. Intensive Care Medicine, 1999, 25: 1360-1366.
2. Drew, B.J. et al. (2005). AHA scientific statement: Practice standards for electrocardiographic monitoring in hospital settings: An American Heart Association scientific statement from the Councils on Cardiovascular Nursing, Clinical Cardiology, and Cardiovascular Disease in the Young: Endorsed by the International Society of Computerized electrocardiology and the American Association of Critical-Care Nurses. J Cardiovasc Nurs, 20(2), 76-106.
3. GE Medical Systems: Solar 8000M Patient Monitor Manual.
4. Alarm notification for physiologic monitoring: Could you benefit from a new strategy? (2007). Health Devices, 36(1), 5-21.
5. Clark T, D. Y. (2006). [Impact of clinical alarms on patient safety](#). October 9, 2009.
6. ECRI Institute. (2010). Top 10 health technology hazards for 2011. Health Devices, 39(11), 385-98.

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7. Graham, K. C., & Cvach, M. (2010). Monitor alarm fatigue: Standardizing use of physiological monitors and decreasing nuisance alarms. *American Journal of Critical Care: An Official Publication, American Association of Critical-Care Nurses*, 19(1), 28; 34.
8. Hazard report. ECG leads-off alarms shouldn't be a low priority. (2003). *Health Devices*, 32(3), 131-132.
9. Korniewicz, D. M., Clark, T., & David, Y. (2008). A national online survey on the effectiveness of clinical alarms. *American Journal of Critical Care: An Official Publication, American Association of Critical-Care Nurses*, 17(1), 36-41.
10. Mondor, T. A., & Finley, G. A. (2003). The perceived urgency of auditory warning alarms used in the hospital operating room is inappropriate. *Canadian Journal of Anesthesia*, 50(3), 221-228.
11. Phillips, J. (2006). Clinical alarms: Complexity and common sense. *Critical Care Nursing Clinics of North America*, 18(2), 145-156.
12. Pierson, D. J. (2009). Reducing ineffective and false alarms in the ICU. *Critical Care Alert*, 17(4), 28-29.
13. Tsien, C. L., & Fackler, J. C. (1997). Poor prognosis for existing monitors in the intensive care unit. *Critical Care Medicine*, 25(4), 614-619.
14. Welch, J. (2011). An evidence-based approach to reduce nuisance alarms and alarm fatigue. *Biomedical Instrumentation & Technology / Association for the Advancement of Medical Instrumentation*, Suppl, 46-52. doi:10.2345/0899-8205-45.s1.46.
15. Yoder, V. J., & Phillips, A. (2010). Alarm management: Clinical perspective. *Biomedical Instrumentation & Technology / Association for the Advancement of Medical Instrumentation*, 44(2), 152-153.

Sponsor:

- Medical Care Evaluation Committee

Developers:

- Critical Care Committee
- Nursing Standards of Care
- Alarm Management Committee
- Clinical Engineering Department

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X. SIGNATURES

Electronic Signature(s)	Date
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Karen Haller Vice President of Nursing and Patient Care Services, The Johns Hopkins Hospital	08/26/2015