SCOPE:

All HCA Healthcare staff and providers involved in providing care, treatment, or services to patients requiring cardiac telemetry monitoring.

GLOSSARY:

- **Cardiac monitoring:** Refers to continuous or intermittent transmission of hearts electrical activity to a monitoring system. Primary methods of continuous cardiac monitoring within the hospital setting include:
    - **Hard-wire monitoring:** Electrode pads (conductive gel discs) are placed on the patient's chest and attached to a lead-cable system and then connected to a monitor at the bedside.
    - **Telemetry monitoring:** Electrode pads are attached to the patient's chest and connected to leads that are attached to a portable monitor transmitter (tele box) providing wireless transmission of the ECG to a remote or centralized monitor/monitoring station.
- **Pulse oximetry monitoring:** Non-invasive monitoring technique that measures the oxygen saturation in the blood by shining light at specific wavelengths through tissue, most commonly the fingernail bed.

PURPOSE:

1. To provide guidelines for telemetry monitoring of patients.
2. To outline process for notification and documentation of cardiac rhythm changes
3. Identify which rhythms or arrhythmias require notification, intervention, and identification of proper escalation procedures
4. Identify cardiac rhythm changes requiring provider notification
5. To assess patients for appropriate discontinuation of cardiac telemetry monitoring.

POLICY:

1. The Registered Nurse (RN) assumes responsibility for the initiation and management of cardiac monitoring including: (a) verification of an order (b) placement of cardiac leads, (c) patient assessment, (d) validation of rhythm transmission, (e) rhythm interpretation, and (f) patient education.
    a. If the RN chooses to delegate elements of this responsibility, tasks must be performed by a caregiver with documented competency, and within their scope of practice.
2. Rhythm strips will be captured, interpreted, and documented in the medical record at a minimum:
    a. Upon admission;
    b. Once per 12-hour shift
    c. With a change in cardiac rhythm, if a 12-lead ECG is not performed;
    d. When a patient experiences chest pain, if a 12-lead ECG is not performed; and
3. The provider will be notified of all lethal and unexpected non-lethal cardiac rhythm changes.

4. All patients on telemetry will maintain IV access throughout the duration of monitoring. Exclusions are reviewed and documented based on patient specific circumstances.

TELEMETRY PROCEDURE STATEMENTS:

I. Telemetry Ordering

1. A provider order is required for telemetry monitoring. The provider will determine the clinical indication for remote telemetry monitoring based on the patient diagnosis and current conditions.
    a. Clinical indications should be selected in alignment with American Heart Association (AHA) Guidelines for Cardiac Telemetry Monitoring (Appendix A), and should be identified within the provider order.
2. When medically indicated, telemetry monitoring will be ordered for a 48-hour period. Clinical evaluation of ongoing medical necessity should be addressed by the provider.
    a. A telemetry DISCONTINUE order should be entered when telemetry monitoring is no longer medically indicated for patient care.
    b. If medical indication for telemetry monitoring persists beyond the ordered 48-hour period, a RENEWAL order should be entered.
    c. An EXPIRED order will trigger a notification or alert to the provider to either renew or discontinue telemetry monitoring as appropriate.

II. Telemetry Application

1. Patients will be placed on telemetry as ordered by the provider.
    a. Telemetry should be applied to a patient within 30 minutes of a provider order.
        i. If the patient is being treated in a clinical area where telemetry monitoring is not available, cardiac monitoring should be maintained via an alternative monitoring source (e.g. hardwire monitoring, transport monitoring).
    b. Patient refusal of or non-compliance with telemetry monitoring requires provider notification. Communication should be documented by the nurse, within the Electronic Health Record (EHR).
2. Following application of telemetry leads, verification of 2 patient identifiers, patient room and bed number, telemetry transmitter (box) number, and signal transmission should be verbally completed with the Monitor/Telemetry Technician prior to leaving the patient's room.
3. Patients with active orders for telemetry monitoring should not be removed from telemetry unless authorized by a provider order.
    a. If telemetry monitoring is paused/interrupted for any reason, the Monitor/ Telemetry Technician should be notified prior to patient removal from telemetry and upon resuming monitoring.

III. Transport of Monitored Patients

1. Interruptions in cardiac monitoring should not occur during transport for patients with active orders for telemetry monitoring.
    a. Patients with active monitoring orders should continue to be remotely monitored, and the Monitor/Telemetry Technician should be notified of off unit travel, destination, primary contact for duration of travel, and anticipated time of return.

b. If remote monitoring is not possible, the patient should be accompanied, on a transport monitor, by an RN competent in cardiac rhythm interpretation.
    i. The accompanying RN will provide handoff communication to an appropriately trained caregiver able to assume care of the patient, or return the patient to the remote telemetry monitoring device and validate rhythm transmission.
    ii. All changes in locations should be communicated to any central or remote monitoring stations pre and post transport.

IV. Patient Monitoring Alarms

1. Cardiac arrythmia & heart rate alarms should remain in the ON position and audible at all times, unless explicitly ordered otherwise by a provider.
    a. Note: For remote monitoring, it is the intended workflow that this is the primary notification pathway and therefore nursing units do not require secondary audibility of all alarm types. Facilities may consider tiers of alarm signals based on product functionality and patient care needs. For example, lethal arrythmias may audibly sound in both patient care areas as well as centralized monitor units.
2. Physiologic alarms default to manufacturer settings. Any adjustments to alarms, based on individual patient condition, require a physician order and communication to the Monitor/Telemetry Technician.
    a. Adjustments to alarms should be made and managed within the centralized monitoring unit.
3. Telemetry alarm settings, parameters, and audibility should be validated each shift, to ensure they are appropriate and that audible alarms will be clearly discernable relative to ambient and competing noise on their respective clinical unit.
4. Caregivers will respond to and escalate alarms as appropriate based on their scope of practice.

V. Cardiac Rhythm Strip Interpretation and Documentation

1. At pre-determined intervals, and at least once every 12 hour shift, a cardiac rhythm strip will be recorded from the monitoring system, interpreted, validated, and documented within the medical record.
2. Documentation will include the following:
    a. Lead of monitoring;
    b. Rate
    c. PR interval
    d. QRS interval
    e. QT interval or QTc, if ordered
    f. Rhythm interpretation
3. Validation of rhythm interpretation should be completed by a Registered Nurse with documented competency in cardiac rhythm interpretation.

VI. Telemetry Escalation Process

1. A change in rhythm may include but is not limited to:
    a. New onset of bradycardia
    b. New onset of tachycardia
    c. Regular rhythm changes to irregular rhythm
    d. Irregular rhythm changes to regular rhythm
    e. Increase in the number of premature complexes
    f. Groupings or runs of premature complexes
    g. Pacemaker failure to sense and/or failure to capture
    h. Change to a life-threatening arrhythmia or dysrhythmia
2. In the event that a **suspected life-threatening rhythm** is detected the Monitor/Telemetry Technician will initiate the following procedure:
    a. Life threatening arrhythmias include:
        i. Sustained ventricular tachycardia: 30 second strip of V-Tach or >30 beat run of V-Tach
        ii. Ventricular fibrillation
        iii. 3rd degree heart block (new onset)
        iv. Asystole
    b. Activate a "Code Blue" response to the patient's bedside.
    c. Subsequently notify the Primary RN or Charge RN and document communication within the EHR, or via the Facility approved pathway.
    d. Capture a copy of rhythm disclosure with interpretation and send to unit
3. In the event that a **non-lethal arrhythmia is detected**, the Monitor/Telemetry Technician will initiate the following procedure:
    a. Initial Notification:
        i. The Monitor/Telemetry Technician will initiate a multi-level escalation process, requiring loop closure/alarm resolution within 5 minutes of the initial arrythmia alarm.
        ii. If resolution is not reached within 5 minutes of the initial arrhythmia alarm, the Monitor/Telemetry Technician will initiate a "Telemetry Alert".
            1) In the event a "Telemetry Alert" is initiated, the House Supervisor and all available personnel on the unit are expected to respond to the patient's announced room number to assure the patient is assessed
            2) The nurse responding to the patient, will notify the monitor tech once the patient has been assessed and give an update on patient status and/or assure the patient's rhythm is being transmitted. In addition, the nurse will notify the provider in the event the changes are an abnormal rhythm.

4. In the event that the patient rhythm **is transmitting** to the central station but the monitor indicates battery low, lead off, or artifact, the Monitor/Telemetry Technician will initiate the following procedure:
    a. Initiate escalation of the alarm to the primary nurse or appropriate designee, and document communication within the EHR, or facility approved pathway.
    b. The nurse or designee will check leads and/or batteries immediately, and verify with the Monitor/Telemetry Technician that the issue is resolved.
    c. If the Monitor/Telemetry Technician is unable to reach the nurse or designee, or the situation is not responded to/resolved within 5 minutes, the Monitor/Telemetry Technician will escalate the notification to the unit Charge RN.
    d. If the situation is not resolved by Charge RN within an additional 5 minutes, the unit Clinical Leader will be notified; House Supervisor will be notified after hours.
    e. The Monitor/Telemetry Technician will record the notification(s) on the approved facility-specific Telemetry Notification log.
    f. If at any point in the alarm escalation process, the patient cardiac rhythm fails to transmit, the Monitor/Telemetry Technician will pivot to the appropriate escalation pathway.
5. In the event that a patient's cardiac rhythm **is not transmitting** to the central monitoring station the Monitor/Telemetry Technician will initiate the following procedure:
    a. The Monitor/Telemetry Technician will initiate a multi-level escalation process, requiring loop closure/alarm resolution within 5 minutes of the initial arrythmia alarm.
    b. If resolution is not reached within 5 minutes of the initial arrhythmia alarm, the Monitor/Telemetry Technician will initiate a "Telemetry Alert".
    c. In the event a "Telemetry Alert" is initiated, the House Supervisor and all available personnel on the unit are expected to respond to the patient's announced room number to assure the patient is assessed
    d. The nurse responding to the patient, will notify the monitor tech once the patient has been assessed and give an update on patient status and/or assure the patient's rhythm is being transmitted. In addition, the nurse will notify the provider in the event the changes are an abnormal rhythm.
    e. Upon assessment, the care team staff will immediately activate any necessary facility-specific rapid response or resuscitation process as indicated based on patient condition.
    f. The Monitor/Telemetry Technician will record the notification(s) on the approved facility-specific Telemetry Notification log.

VII. Telemetry Downtime

1. In the event telemetry monitoring data cannot be transmitted/received, the following actions will be taken:
    a. Monitor/Telemetry Technician or nurse will complete the following:
        i. Notify the medical/surgical/telemetry nursing staff and director of telemetry downtime

ii. Notify house-supervisor

iii. Notify Bio-med and IT Director

iv. Ensure tickets are entered into appropriate systems (i.e., ServiceCentral) for awareness and tracking

a. Charge nurse or designee will assign a staff member to round on all monitored patients.

b. A review and triage process of monitored patients will be completed. Communication to the respective providers will be attempted to determine if any patients are appropriate to discontinue from telemetry monitoring.

c. Patients with continued need for monitoring will be placed on bedside monitors as resources permit. If bedside monitoring is available as an alternative to central monitoring:

d. Staff will verify alarm settings and volume audibility

e. Monitoring and assessments will be completed per unit standard.

f. If there is no available monitoring capability, patient vital signs and physical assessments will be performed as frequently as resources allow. Every effort will be made to obtain EKG waveforms at least once per shift.

VIII. Discontinuation for Cardiac Telemetry Monitoring

1. Telemetry may be discontinued following receipt of a provider order.
2. When a patient discharge order is received and continuation of cardiac monitoring after DC is not ordered, the cardiac monitoring may be discontinued. Exclusions are reviewed and documented based on patient specific circumstances.
3. Upon discontinuation:
    a. Telemetry removal should be communicated to the Monitor/Telemetry Technician, and a monitoring STOP time should be documented in the EHR.
    b. Patient should be removed from the Central Monitoring Unit system.
    c. Telemetry pack should be disinfected according to manufacturing guidelines and the batter removed and disposed of properly.

REFERENCES:

Appendix A – AHA Guidelines for Cardiac Telemetry Monitoring

Appendix B – Telemetry Initiation Workflow

REFERENCES:

Drew, B.J., Califf, R.M., Funk, M., Kaufman, E.S., Krucoff, M.W., Laks, M.M., Macfarlane, P.W., Sommargren, C., Swiryn, S., & Van Hare, G.F. (2004). 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. *Circulation, 110*(17), 2721-2746. https://doi.org/10.1161/01.CIR.0000145144.56673.59

Sandau, K.E., Funk, M., Auerbach, A., Barsness, G.W., Blum, K., Cvach, M., Lampert, R., May, J.L., McDaniel, G.M., Perez, M.V., Sendelbach, S., Sommargren, C.E., Wang, P.J. (2017). Update to practice standards for electrocardiographic monitoring in hospital settings: A scientific statement from the American Heart Association. *Circulation, 136*(19), e273-e344. https://doi.org/10.1161/CIR.0000000000000527

The Joint Commission. (2020). *The Comprehensive Accreditation Manual for Hospitals*, 2020 – NPSG.06.01.01, EC.02.04.01, EP 3

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Appendix A – AHA Guidelines for Cardiac Telemetry Monitoring

Patient Population / Indication	Class I (Should be performed)	Class IIa (Reasonable to perform)	Class IIb (May be considered)	Class III (No benefit)
Early-Phase ACS (<24hr) for intermediate-or high-risk Non-ST-Elevated ACS or STEMI	Initiate immediately and continue uninterrupted ≥ 24-48 hours			
After MI, with revascularization of all ischemic lesions	Initiate immediately and continue uninterrupted ≥12–24 hours			
After MI, without revascularization of all ischemic lesions	Initiate immediately and continue uninterrupted ≥ 24-48 hours			
Targeted Temperature management	Continuous monitoring through duration of therapy			
Vasospastic angina	Until symptoms resolved			
Stress cardiomyopathy	Until symptoms resolved			
Newly diagnosed left main lesion	Until revascularized			
After non-urgent PCI with complications		For ≥ 24 hours or until complication resolved		
After non-urgent PCI without complications				No monitoring outside of post-procedure area or beyond sheath removal
After routine, diagnostic coronary angiography				No monitoring outside of post-procedure area
Low-risk and non-cardiac chest pain				If normal EKG and negative biomarkers
Post open heart surgery	• Uncomplicated (48-72 hours) • High risk for A. fib			
Mechanical Circulatory Support	• Clinically significant CV or hemodynamic deterioration • Immediately after implant	• Admitted with non-cardiac problems		• Admitted to a rehab facility
After Transcatheter Aortic Valve Replacement	≥ 3 days after procedure	After day 3		

After other transcatheter interventions	Duration depends on procedure, device, and patient factors.			
Arrhythmias	• Sustained VTs and post-resuscitation • New or recurrent A. fib • Unstable A. fib • Ongoing rate control management • Initiation of new antiarrhythmic agent • Symptomatic bradycardia • Symptomatic second- or third-degree blocks • If congenital or genetic arrhythmic syndromes	• If A. fib and patient is unstable • Asymptomatic bradycardia with accompanying medication administration	• Non-sustained VTs	• If A. fib and admitted for reason other than rate or patient is stable • If bradycardic and admitted for reason other indication or patient is stable • If Wenckebach or vagal in origin
Syncope of suspected cardiac origin	Monitor ≥ 24 hours until cause and treatment identified			
Electrophysiology Ablation Procedures	Monitor for 12-24 hours minimum after: • Complex ablation • AV nodal ablation		After uncomplicated SVT ablation, can be discontinued after immediate post-procedure area	
Electrophysiology Device Procedures	• Continuous monitoring with use of transcutaneous pads or transvenous wires • Monitor pacemaker dependent patients for 12-24 hours • Continuous monitoring for duration of related hospitalization of patients receiving ICD shocks	• Day one of semi-permanent transvenous pacing	• After day one of semi-permanent transvenous pacing • Monitor non-pacemaker dependent patients for 12-24 hours • Immediate post procedure period of generator changes	• ICD or pacemaker patient admitted for unrelated indication • Wearable defibrillator patient admitted for unrelated indication
Acute, decompensated heart failure	Continuous monitoring until precipitating event is successfully treated			
Infective endocarditis		Continuous monitoring until clinically stable		

Post-conscious sedation			May be of benefit until patients are breathing per baseline and stable	
Non-cardiac surgery				Not indicated broadly among asymptomatic post-operative patients
Non-cardiac major thoracic surgery		Initiate in post-operative phase and continue through discharge if needed to identify A. fib		
Stroke	Monitor 24-48 hours	Continue monitoring if cryptogenic stroke		
Potassium of Magnesium Imbalances	Until normalization of electrolytes			
Drug overdose	Monitor until drugs have cleared patient's system and clinically stable			
Hemodialysis			Consider if there is another indication for monitoring outside of hemodialysis	
DNR/DNI	When data gained from monitoring would trigger interventions consistent with patient wishes (e.g. rate control)			When data will not be acted on and comfort-focused care is the goal

Appendix B – Telemetry Initiation Workflow