DEFINITIONS:

Cardiac monitoring, also referred to as ECG (electrocardiographic) monitoring, is defined as any of the following:

- Bedside monitors only (monitored by bedside nurse/physician)
- Bedside monitors with central monitoring occurring within the unit (monitored by bedside nurse)
- Telemetry with central monitoring occurring within the unit (monitored by bedside nurse)
- Telemetry with remote central monitoring occurring within the unit (monitored by central monitoring nurse)
- Telemetry with remote central monitoring occurring off the unit (monitored by central monitoring nurse)

Telemetry: as a monitoring system attached to the patient which uses a wireless network to transmit ECG data continuously to a centralized monitor location.

Roles:

Licensed Practical Nurses (LPNs): LPN certification for this Additional Competency is under review by the SHR Nursing Practice Committee. As assigned, currently certified LPNs may continue to provide ECG Monitoring and Rhythm Interpretation. LPNs requiring initial certification will not be certified until the review is completed.

Registered Nurses (RNs): RNs identified by their manager in targeted practice settings will be certified in the RN Specialty Practice (RN Procedure): ECG Monitoring and Rhythm Interpretation

1. PURPOSE

1.1 To apply best practice standards to ECG monitoring to ensure prompt detection of changes in heart rate or rhythm.
2. POLICY

2.1 The RN certified in this RNSP will have first completed the following learning modules/activities prior to providing cardiac monitoring and rhythm interpretation independently:
   - Attended an educational session on cardiac monitoring and rhythm interpretation
   - Completed the learning package and quiz and returned to CNE
   - Complete skills checklist with certified RN to validate and ensure safety checks are followed appropriately

2.2 Physician order required
   - Physician will order monitoring
   - Physician will use appropriate approved forms to order monitoring. Example: if patient requires telemetry; recommended Telemetry Order Set (Appendix B)
   - If ECG monitoring is a physician order, then an order to discontinue ECG monitoring (temporary or permanent) is also required.
   - Units which utilize ECG monitoring may have unit specific standards pertaining to the monitoring requirements of that patient population. (i.e. PACU, ER, PICU, NICU, Acute Care Pediatrics)

2.3 Special Considerations
   - ECG monitoring may be initiated by a certified nurse if it will assist in their clinical assessment.
   - If ECG monitoring is initiated by a certified nurse, it may be discontinued by the nurse, if the clinical condition is stable, unless there is a written physician order to continue ECG monitoring.
   - The Most Responsible Physician (MRP) or designate is responsible for decisions regarding the significance and treatment of identified arrhythmias.
   - In a circumstance where the nurse is not certified in ECG Monitoring and Rhythm Interpretation and bedside ECG monitoring is initiated by the physician, ECG monitoring is the responsibility of the physician.

3. PROCEDURE

3.1 Initiating ECG monitoring:

   With bedside ECG monitoring the certified nurse:

   3.1.1 Explains the purpose of ECG monitoring to the patient and family.

   3.1.2 Applies the electrodes to the appropriate location and attaches the correct cables to each electrode. (See Appendix A).

   Note: Electrodes are to be changed q24hours and prn.

   3.1.3 Selects an appropriate Lead in which to monitor the patient

   3.1.4 Ensures that an acceptable ECG tracing is present

   3.1.5 Sets the appropriate alarm limits based on the initial rate / rhythm and ensures alarms are set to the ON position.
NOTE: Pediatrics- Alarms are set that are appropriate for the patient’s age or as ordered by physician.

With remote ECG monitoring the bedside nurse:

3.1.6 Explains the purpose of ECG monitoring to the patient and family.

3.1.7 Applies the electrodes to the appropriate location and attaches the correct cables to each electrode. (See Appendix A)

3.1.8 Ensures that the central station is receiving an acceptable tracing

3.1.9 Communicates to certified central monitoring nurse the following:
   - Patient identifiers (name, age, gender, medical record number)
   - Patient room, unit and contact phone number
   - Attending MRP
   - Diagnosis and reason for ECG monitoring
   - Relevant history and medications

3.1.10 Takes responsibility for ongoing surveillance of telemetry system integrity

With remote ECG monitoring the certified central monitoring nurse:

3.1.11 Sets the appropriate alarm limits based on the initial rate / rhythm and ensures alarms are set to the On position

3.2 Ongoing Care

With bedside ECG Monitoring the certified nurse:

3.2.1 Checks the alarm limit settings at the start of every shift and continues to adjust the alarm limits as the patient’s rhythm and condition warrant.

3.2.2 Reviews every shift the monitoring trends and alarms. (If monitor capability exists)

3.2.3 Reassesses the patient for signs of hemodynamic compromise with any significant changes in cardiac rate or rhythm (ie. BP, oxygen saturation, respiratory rate, signs of myocardial ischemia etc.)

3.2.4 Reports to the MRP or designate
   - Life threatening cardiac arrhythmias and initiates appropriate actions.
   - Significant changes in cardiac rate and/or rhythm
   - New or unexpected changes in the cardiac rate, rhythm or clinical status.

3.2.5 Ensures that temporary discontinuance of ECG monitoring during patient transfer for tests or personal care does not occur unless ordered by the MRP or designate.

3.2.6 Reviews daily the continued requirement for ECG monitoring

With remote ECG monitoring the certified central monitoring nurse:

3.2.7 Checks the alarm limit settings at the start of every shift and continues to adjust the alarm limits as the patient’s rhythm and condition warrant.
3.2.8 Reviews every shift the monitoring trends and alarms. (If monitor capability exists)

With remote ECG monitoring the bedside nurse:

3.2.9 Reassesses the patient for signs of hemodynamic compromise with any significant changes in cardiac rate or rhythm (i.e. BP, oxygen saturation, respiratory rate, signs of myocardial ischemia etc.)

3.2.10 Reports to the MRP or designate
- Life threatening cardiac arrhythmias and initiates appropriate actions.
- Significant changes in cardiac rate and/or rhythm
- New or unexpected changes in the cardiac rate, rhythm or clinical status.

3.2.11 Ensures that temporary discontinuance of ECG monitoring during patient transfer for tests or personal care does not occur unless ordered by the MRP or designate.

3.2.12 Reviews daily the continued requirement for ECG monitoring

3.3 Communication with telemetry and remote central monitoring

3.3.1 The bedside nurse communicates with the certified central monitoring nurse when:
- There has been a sudden change in the patient’s condition
- There has been a change in the patient’s cardiac medications, (i.e. new, discontinued or dose adjustment)
- The patient will be temporarily off telemetry or is returning from temporary absence
- A report on the patient trends is required
- ECG monitoring has been ordered discontinued.

3.3.2 The certified central monitoring nurse communicates with the bedside nurse when:
- An acceptable ECG tracing is not being received
- A change from the patient’s baseline occurs
- Potential life threatening arrhythmias occur
- Non-life threatening rhythms / rates occur that are a significant change from the previous monitoring trends
- Additional clinical information is required to clarify the significance of cardiac rate / rhythm changes noted.

3.4 Documentation

3.4.1 The cardiac rhythm will be interpreted and documented in the patient chart at the initiation of cardiac monitoring and at the beginning of every shift.

Note: May use ECG Interpretation Strip (Appendix C)

3.4.2 All documented ECG strips must have the required patient identifiers and include the date and time of the strip

3.4.3 All cardiac rates / arrhythmias which require immediate intervention must be documented in the patient’s chart.

3.4.4 Remote central monitoring by other than bedside nurse:
3.4.4.1 Bedside nurse documents
- Verbal report given by certified central monitoring nurse at shift end and prn

3.4.4.2 Certified central monitoring nurse documents on the telemetry record:
- Initial baseline rhythm strip and significant arrhythmias as they occur
- Shift trends and significant events / treatments
- Sends tracing documentation to unit daily (AM) and prn
- Times of verbal communication with bedside registered or licensed nurse

4. REFERENCES


Appendix A

Electrode Placement

**Standard Lead Placement** – Five electrodes
White – RA
Black – LA
Green – RL
Red – LL
Brown – C right or left sternal border @ 4th intercostal space

<table>
<thead>
<tr>
<th>LEAD</th>
<th>Lead Color</th>
<th>EASI Lead Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>brown</td>
<td>On the lower sternum at the level of the fifth intercostal space</td>
</tr>
<tr>
<td>A</td>
<td>red</td>
<td>On the left midaxillary line at the same level as the E electrode</td>
</tr>
<tr>
<td>S</td>
<td>black</td>
<td>On the upper sternum</td>
</tr>
<tr>
<td>I</td>
<td>white</td>
<td>On the right midaxillary line at the same level as the E electrode</td>
</tr>
<tr>
<td>N</td>
<td>green</td>
<td>Can be anywhere, usually below the sixth rib on the right hip</td>
</tr>
</tbody>
</table>

*Ensure that the lead placement corresponds to the ECG monitor configuration. (EASI or Standard lead placement)
Incorrect placement will result in inaccurate ECG tracings.

NOTE: Make sure that the S and E electrodes line up vertically on the sternum and that the I, E and A electrodes align horizontally.
Chest Lead Placement for (LifePak 15)

Chest leads are in addition to the standard three lead system, but includes a right leg (RL) lead as well.
## Telemetry Order Set

**At RUH only:** fax signed completed orders to CCU (fax #1347) excluding patients located on RUH ward 6000

<table>
<thead>
<tr>
<th>Service requesting telemetry:</th>
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</thead>
<tbody>
<tr>
<td>Admitting diagnosis:</td>
<td></td>
</tr>
<tr>
<td>Documented Code Status:</td>
<td></td>
</tr>
<tr>
<td>Patient ward / location:</td>
<td></td>
</tr>
<tr>
<td>Order faxed to CCU:</td>
<td></td>
</tr>
<tr>
<td>date</td>
<td></td>
</tr>
<tr>
<td>time</td>
<td></td>
</tr>
</tbody>
</table>

### Consults

- Has Cardiology been consulted?  
  - Yes  
  - No

### Monitoring

- Telemetry monitoring for:  
  - 24h  
  - 48h  
  - Other

- Interruption of telemetry (i.e. showers / diagnostic test, etc.)  
  - Yes  
  - No

- Baseline 12 lead ECG faxed to CCU

### Reasons for Telemetry Monitoring

- Post arrest
- Acute Coronary Syndrome (ACS)
- Post myocardial infarction (MI)
- Cardiovascular (CV) surgery
- Potential for lethal arrhythmias after initial control
- Response to therapy of known arrhythmias
- Significant / symptomatic tachycardia
- Significant / symptomatic bradyarrhythmia / AV block
- New onset or symptomatic atrial fibrillation / atrial flutter
- Syncope (rule-out arrhythmia)
- Long QT with potential for arrhythmia
- Electrolyte disorders
- Stroke
- Evaluation of permanent pacemaker / ICD function
- Overdose of drugs known to have cardiac arrhythmia implications
- Selected surgical patients pre or post operation (rule-out arrhythmia)
- Obstetrical patient with congenital / acquired heart disease
- Other

### Telemetry Review / Discontinuation

- Telemetry to be reviewed q24h by:  
  ____________________________

- Telemetry will be discontinued after designated time by telemetry RN if no arrhythmia detected  
  (to continue telemetry past the designated time a new order MUST be completed and faxed to CCU)

- Telemetry discontinued by:  
  ____________________________  
  RN Date: __________  Time: ________

### Practitioner Printed Name  Practitioner Signature  Date/Time

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Notice of confidentiality: Contains information that is time sensitive or confidential. Use, disclosure, copying or communication of the contents is prohibited. If you have received it in error, notify the SHPR Pharmacy Manager, Operations (306-555-5889).
<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
<th>Lead:</th>
<th>Electrode placement verified</th>
<th>Electrodes changed (q24h &amp; pm)</th>
<th>E-Collar measurements onstrip:</th>
<th>P wave:</th>
<th>PR Int:</th>
<th>QRS:</th>
<th>QT Int:</th>
<th>QTc:</th>
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<tbody>
<tr>
<td></td>
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<td>Complete below</td>
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</table>

**ECG INTERPRETATION STRIPS**

Please attach rhythm strip within the border using glue stick or tape.

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Please attach rhythm strip within the border using glue stick or tape.

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Please attach rhythm strip within the border using glue stick or tape.

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Form #104128  09/2016  Category: Flow Sheets