	Policy and Procedures RNSP: RN Procedure Title: CARDIAC (ECG) MONITORING (Adults and Pediatrics) I.D. Number: 1142
Authorization: [X] SHR Nursing Practice Committee	Source: Nursing Date Revised: November 2016 Date Effective: October 2004 Scope: SHR - Acute

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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

Aehlert, B (2013). ECGs made incredibly easy. (5th edition). St. Louis: Elsevier

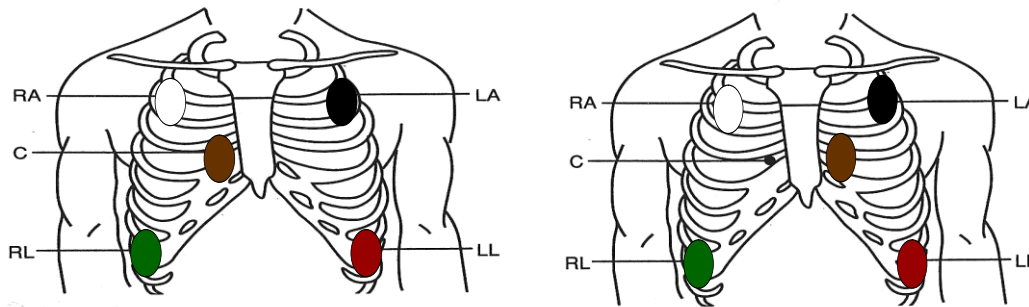
Drew, B.J. et al. (2004). Practice standards for electrocardiographic monitoring in hospital settings: An American Heart Association scientific statement from the Councils on Cardiovascular Nursing, Clinical Cardiology, and Cardiovascular Diseases in the Young; Endorsed by the International Society of Computerized Electrocardiology and the American Association of Critical Care Nurses. *Circulation Journal of the American Heart Association*, 110:2721-2746

Huff, J. (2011). ECG Workout Exercises in Arrhythmia Interpretation. 6th Ed., Philadelphia: Lippincott Williams & Wilkins

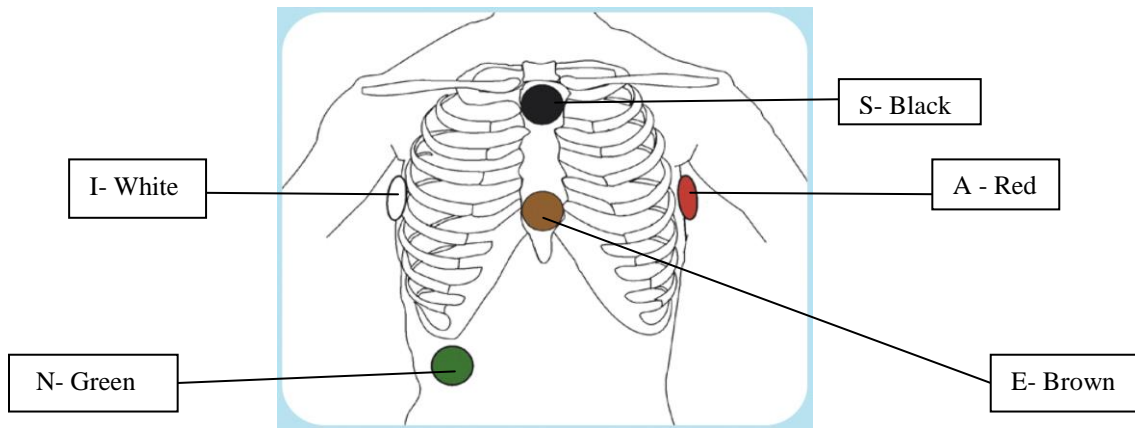
Novak, C, Gill, P. (2016) Pediatric Vital Sign Reference Chart. April 21, 2016
<http://www.pedscases.com/pediatric-vital-signs-reference-chart>

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

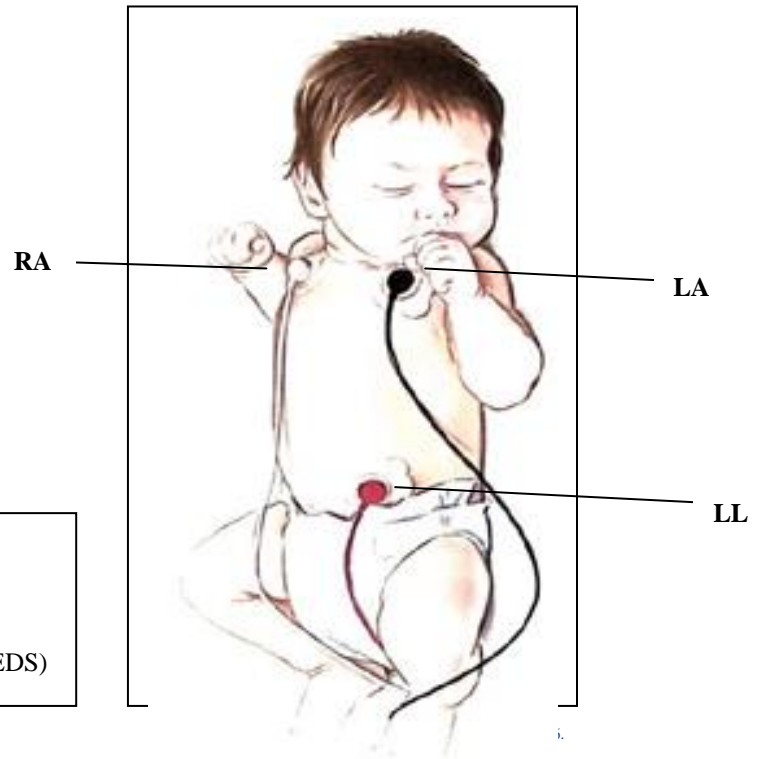
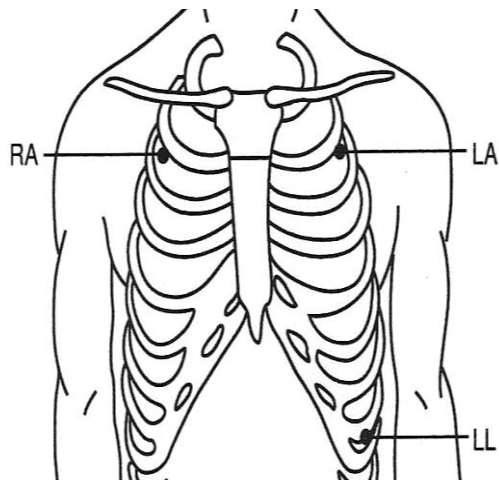


EASI Lead

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

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

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



Three Lead System

White- RA

Black- LA

Red- LL (may be) OR Green-LL (PEDS)

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.

Appendix B



RUH SCH SPH
 OTHER: _____

PATIENT IDENTIFICATION

Telemetry Order Set	ACTION			
	MAR	ICP	REG	RN
<p>At RUH only: fax signed completed orders to CCU (fax #1347) excluding patients located on RUH ward 6000</p> <p>Service requesting telemetry: _____</p> <p>Admitting diagnosis: _____ Documented Code Status: _____</p> <p>Patient ward / location: _____ Order faxed to CCU: date _____ time _____</p> <hr/> <p>Consults</p> <p>Has Cardiology been consulted? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <hr/> <p>Monitoring</p> <p>Telemetry monitoring for: <input type="checkbox"/> 24h <input type="checkbox"/> 48h <input type="checkbox"/> Other _____</p> <p>Interruption of telemetry (i.e. showers / diagnostic test, etc.) <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Baseline 12 lead ECG faxed to CCU</p> <hr/> <p>Reasons for Telemetry Monitoring</p> <p><input type="checkbox"/> Post arrest</p> <p><input type="checkbox"/> Acute Coronary Syndrome (ACS)</p> <p><input type="checkbox"/> Post myocardial infarction (MI)</p> <p><input type="checkbox"/> Cardiovascular (CV) surgery</p> <p><input type="checkbox"/> Potential for lethal arrhythmias after initial control</p> <p><input type="checkbox"/> Response to therapy of known arrhythmias</p> <p><input type="checkbox"/> Significant / symptomatic tachyarrhythmia</p> <p><input type="checkbox"/> Significant / symptomatic bradyarrhythmia / AV block</p> <p><input type="checkbox"/> New onset or symptomatic atrial fibrillation / atrial flutter</p> <p><input type="checkbox"/> Syncope (rule-out arrhythmia)</p> <p><input type="checkbox"/> Long QT with potential for arrhythmia</p> <p><input type="checkbox"/> Electrolyte disorders</p> <p><input type="checkbox"/> Stroke</p> <p><input type="checkbox"/> Evaluation of permanent pacemaker / ICD function</p> <p><input type="checkbox"/> Overdose of drugs known to have cardiac arrhythmia implications</p> <p><input type="checkbox"/> Selected surgical patients pre or post operation (rule-out arrhythmia)</p> <p><input type="checkbox"/> Obstetrical patient with congenital / acquired heart disease</p> <p><input type="checkbox"/> Other</p> <hr/> <p>Telemetry Review / Discontinuation</p> <p>Telemetry to be reviewed q24h by: _____</p> <p>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)</p> <p>Telemetry discontinued by: _____ RN Date: _____ Time: _____</p>				
<p>_____ PRACTITIONER PRINTED NAME</p> <p>_____ PRACTITIONER SIGNATURE</p> <p>_____ DATE/TIME</p>				

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Appendix C



SASKATOON HEALTH REGION
Saskatoon, Saskatchewan

RUH SCH SPH Other _____

Patient Label

NAME: _____

HSN: _____

D.O.B.: _____

ECG INTERPRETATION STRIPS

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

Date: _____ Time: _____ Lead: _____ Electrode placement verified Electrodes changed (q24h & pm)
 Rhythm: Reg Ireg E-Caliper measurements on strip: Yes No - complete below
 Rate: _____ P wave: _____ PR. Int _____ QRS: _____ QT Int: _____ QTc: _____
 ST Segment: Isoelectric Depressed Elevated TWave: Positive Inverted Flattened Peaked
 Interpretation: _____ See Progress Notes Initials: _____

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

Date: _____ Time: _____ Lead: _____ Electrode placement verified Electrodes changed (q24h & pm)
 Rhythm: Reg Ireg E-Caliper measurements on strip: Yes No - complete below
 Rate: _____ P wave: _____ PR. Int _____ QRS: _____ QT Int: _____ QTc: _____
 ST Segment: Isoelectric Depressed Elevated TWave: Positive Inverted Flattened Peaked
 Interpretation: _____ See Progress Notes Initials: _____

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

Date: _____ Time: _____ Lead: _____ Electrode placement verified Electrodes changed (q24h & pm)
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 ST Segment: Isoelectric Depressed Elevated TWave: Positive Inverted Flattened Peaked
 Interpretation: _____ See Progress Notes Initials: _____