Saskatoon Health Region	Policies & Procedures **RNSP: RN Clinical Protocol, Advanced RN Intervention** **RNSP: RN Clinical Protocol, Health Condition in an Emergency** **Title: CARDIOVERSION – ELECTIVE & URGENT** I.D. Number: **1057**
Authorization: [X] SHR Nursing Practice Committee	Source: Nursing Date Revised: February 2017 Date Effective: November 2013 Scope: **SHR Acute Care**

DEFINITION

Cardioversion - Synchronized Electrical Cardioversion (Cardioversion) is the delivery of an electrical shock to the heart, during a specific time in the cardiac cycle to terminate a cardiac arrhythmia.

ROLES:

Registered Nurses (RNs): identified by their manager in targeted practice settings, will be certified in the RN Specialty Practices: RN Clinical Protocol: Advanced RN Intervention: Cardioversion Elective, and /or RN Clinical Protocol: Health Condition in an Emergency: Cardioversion Urgent.

1. PURPOSE

1.1 To ensure safety during electrical cardioversion of cardiac arrhythmias.

2. POLICY

2.1 All patients requiring cardioversion will be cared for by certified RNs where they can be monitored appropriately with appropriate personnel present (i.e. Code team in non-critical care areas).

2.2 **The Registered Nurse will:**

2.2.1 Be certified Cardiac (ECG) Monitoring.

2.2.2 Obtain certification in the RNSP Clinical Protocol RN Advanced Intervention by completing the following learning modules/activities prior to participating in cardioversion.

2.2.2.1 review of cardioversion learning package, completion of quiz, simulated guided learning experience,

2.2.2.2 Performing hands-on return demonstration of skill.

2.2.3 Obtain certification for the RNSP Clinical Protocol Health Condition in an Emergency (when the patient is unstable with a pulse and a physician is not immediately available)
- 2.2.3.1 All of the requirements for the RNSP Advanced Intervention
- 2.2.3.2 **Current ACLS Provider Status** (for protocol, see Appendix C)
- 2.2.3.3 Continuing Education requirements: Annual review of clinical protocol including hands-on return demonstration. (See Appendix C).

2.2.4 Refer to the Moderate Sedation for Adults (Age 18 Years & Older) policy 1132 for adults and Procedural Sedation/Analgesia Guidelines – Pediatric policy 1121.

2.2.5 Elective and urgent cardioversion only occurs under the direct supervision of the MRP or designate when a patient is stable.

Note: *PICU/PICU Transport Team: See PICU Policy & Procedure Manual for Unit Specific Policy*

2.2.6 Urgent cardioversion in an unstable patient only occurs by a nurse certified in RNSP Clinical Protocol Health Condition in an Emergency (see Appendix C).

3. PROCEDURE

3.1 The MRP or designate will:

3.1.1 <u>For Elective Procedures:</u>
- 3.1.1.1 Obtain a written consent for elective cardioversion
- 3.1.1.2 Order appropriate bloodwork prior to cardioversion.
- 3.1.1.3 Order NPO and clear fluid status for each patient.
- 3.1.1.4 Book procedure and consult the intake anesthetist (SPEC). For pediatrics PICU consult required.
- 3.1.1.5 Order appropriate energy level(s).
- 3.1.1.6 Supply all relevant past medical history, lab work and medication list to SPEC team.

3.2 The Registered Nurse will:

3.2.1 Verify correct patient with two identifiers and that informed consent has been obtained

3.2.2 Check that suction equipment and airway management equipment are readily available and in working order.

3.2.3 For unstable patients, do not delay immediate cardioversion.

3.2.4 Obtain a baseline patient assessment including vital signs, $Sp0_2$, $ETC0_2$ (if available), cardiac rhythm, (12 lead ECG as ordered), peripheral pulse, level of consciousness, NPO status and current medications. For non-urgent procedures obtain a baseline auscultation of respiratory and cardiac systems.

3.2.5 Check anticoagulation status of patient and review other blood work as ordered.
- INR is in therapeutic range for last few weeks if on Warfarin.
- If anticoagulation other than Warfarin, ensure that the patient has taken their anticoagulant consistently for the past few weeks

Note: *For patients in atrial fibrillation or atrial flutter less than 48 hours anticoagulation therapy may not be necessary*

3.2.6 Ensure the patient has a patent vascular access either intravenous (IV) or intraosseous (IO).

3.2.7 Pre-oxygenate as ordered or appropriate for the patient's condition.

Note: *There should be an Anesthesiologist/MRP or designate present whose responsibilities include administration of appropriate sedation/analgesia. In urban centers the RRT or SPEC should be present and are responsible for airway management and oxygen administration.*

3.2.8 *Attach the defibrillator to the patient using defibrillator ECG leads and hands free electrodes. For correct electrode placement, see Appendix A.*

Attach the defibrillator to the patient using defibrillator ECG leads and hands free electrodes. For correct electrode placement, see Appendix A.

3.2.9 Add pad placement(copy)

Note*: Use of hands free electrodes is recommended*

3.2.10 Engage the 'sync' button and ensure the R waves are correctly flagged.

Note*: If they are not correctly flagged choose another lead or adjust the amplitude.*

3.2.11 Once the Anesthesiologist/MRP or designate has ascertained that the appropriate level of sedation has been achieved, prepare to cardiovert immediately.

3.2.12 For elective cardioversion, select appropriate energy level as ordered by the MRP or designate. (See Appendix B for Advanced Cardiac Life Support (ACLS) & Pediatric Advanced Life Support (PALS) energy level recommendations).

3.2.13 Charge the defibrillator to selected energy level.

3.2.14 Ensure the field is clear for cardioversion by giving a verbal warning and doing a visual check of the scene.

Note: *It is the responsibility of the defibrillator operator to ensure the safety of all personnel prior to delivering the shock.*

Note: *Disconnect oxygen source during shock delivery to reduce risk of combustion.*

Note: *All fluids in contact with the patient should be considered electrical conductors.*

3.2.15 Press and hold the discharge current button until the shock is delivered.

3.2.16 Recheck the rhythm and pulse.

Note: *If the first shock is unsuccessful in converting the rhythm, additional shocks at increasing energy levels may be ordered. Prior to the delivery of subsequent shocks:*

Ensure the 'sync' button is engaged and R waves are correctly flagged (On most defibrillators the 'sync' button defaults OFF after each shock).

Check with the Anesthesiologist/MRP or designate as additional sedation may be required.

3.3 **Post-Cardioversion Care:**

3.3.1 Reassess the patient. Continue with ECG monitoring and assess vital signs, (HR, BP, RR, $ETCO_2$ if available, SpO_2) q 3-5 minutes until stable and then q 15 minutes x 2 or as otherwise ordered.

3.3.2 Obtain a 12 lead ECG as ordered.

3.3.3 Administer supplemental oxygen to maintain oxygen saturations per practitioner order.

3.3.4 Ensure the airway remains patent until the patient is awake.

3.4 **Documentation:**

3.4.1 Document pre and post cardioversion assessments including vital signs.

3.4.2 Document ECG rhythm strips; including pre and post procedure strips and all cardioversion attempts (include the joules used).

4. REFERENCES

American Heart Association. (2016). Advanced Cardiovascular Life Support Provider Manual 2015 Guidelines.

American Heart Association. 2015 Web-based Integrated 2010 & 2015 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Retrieved from: https://eccguidelines.heart.org/index.php/circulation/cpr-ecc-guidelines-2/part-7-adult-advanced-cardiovascular-life-support/

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Link MS, et al. (2010) Part 6: electrical therapies: automated external defibrillators, defibrillation, cardioversion, and pacing: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 122(suppl 3):S706 –S719.

Soar, J., Nolan, J., Bottiger, B.W., Perkins, G.D., Lott, C., Carlie, P. & Deakin, C.D. (2015). European resuscitation council guidelines for resuscitation 2015. Section 3. Adult advanced life support. *Resuscitation,* 95,100-147.

Pediatric Advanced Life Support (PALS) Provider Manual. (2016). American Heart Association.

Regina Qu'Appelle Health Region (2015). Cardioversion – Emergency, RN – Clinical Protocol.

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Appendix A

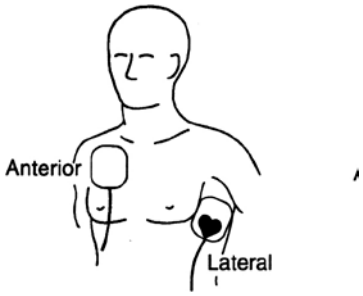
Positioning of Electrodes

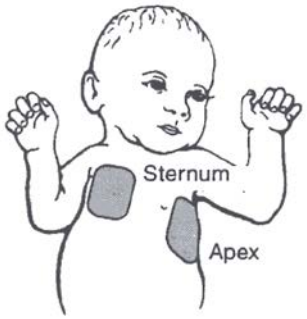
Note: Electrodes / paddles should be positioned at least 2.5 cm away from implanted devices. Use an alternate electrode placement to avoid medical devices. Do not place over medication patches. The skin must be dry. If the electrode site is hairy, clip the hair prior to electrode placement. Remove any metal jewelry from the chest or neck area.

Hands Free Electrodes (Recommended Method)

Anterior/lateral position

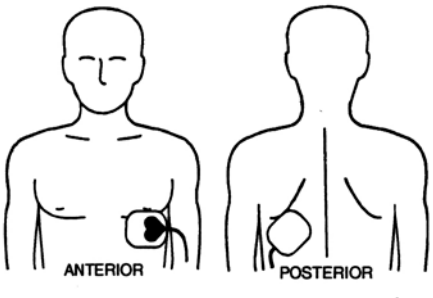
- Position an electrode on the upper right chest wall, lateral to the sternum, below the right clavicle
- Position the other electrode on the left chest wall, lateral to the left nipple in the mid-axillary line, with the center of the electrode in the mid-axillary line if possible. Do not place over any breast tissue. Long axis of apical paddle should be cranio-caudal (head to foot) direction to decrease transthoracic impedance

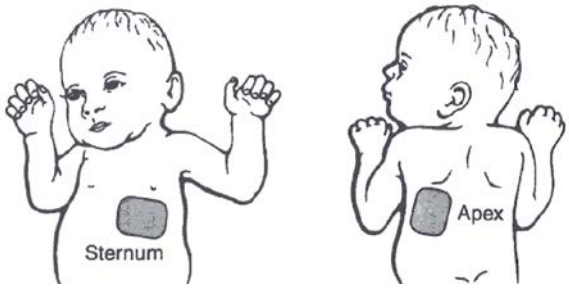




Anterior Posterior Position

- Position an electrode over the left precordium. The upper edge of the electrode should be just below the left nipple with the center of the electrode in the mid clavicular line. Some variations of this may occur due to patient anatomy.
- Position the other electrode behind the heart inferior to the left scapula.





Alternate positioning of electrodes for cardioversion of supraventricular arrhythmias include:

- Placing an electrode over the left precordium and the other electrode on the patient's right posterior infrascapular area.

OR

- Place an electrode to the right of the sternum and the other electrode on the patient's left infrascapular area.

  Note: *Special Pediatric Hands Free Electrodes should be used for children (see manufacturer's recommendation for maximum weight for their use).*

Appendix B

2015 Advanced Cardiac Life Support (ACLS) & Pediatric Advanced Life Support (PALS) energy recommendations for synchronized cardioversion.

NOTE: SHR utilizes Biphasic Defibrillators (i.e.LifePak 20e, LifePak 15)

Adult

	Synchronized cardioversion starting energy level **Biphasic** If initial shock fails increase energy level in a stepwise fashion
Regular Narrow complex tachycardia (SVT, Atrial Flutter)	50- 100 Joules
Irregular narrow complex tachycardia (Atrial Fibrillation)	120-200 Joules
Wide regular complex (with a pulse)	100 Joules

Pediatrics

	Starting Energy Level
First Shock	0.5 – 1 joule/Kg
Subsequent shocks	Increase to 2 joules/kg

Appendix C

RN – Clinical Protocol for Cardioversion in an Emergency (taken from Regina Qu'Appelle Health Region Cardioversion – Emergency, RN – Clinical Protocol and adapted)

A clinical protocol outlines a series of actions that a RN may implement **without a patient specific order** providing:

- The patient meets inclusion criteria.
- The RN is currently ACLS certified (ACLS certifications expire after 2 years) and meets the educational requirements for the RNSP – Clinical Protocol Cardioversion and their clinical area is targeted for the RNSP – Clinical Protocol Cardioversion

INCLUSION CRITERIA

- Safe patient environment including provider's ability to ensure follow-up care

Rhythm	Patient Condition & Treatment
Unstable Supraventricular Tachycardia (SVT)/ Unstable Ventricular Tachycardia (VT) with a palpable pulse	Hemodynamically unstable signs and symptoms include: hypotension, altered mental status, signs of shock, ischemic chest discomfort or acute heart failure. Synchronized cardioversion may be performed by a certified RN in the absence of a physician.

EXCLUSION CRITERIA

- Advanced care plan indicating no cardioversion
- Unsafe patient environment to perform cardioversion
- Cardioversion on non-critical care nursing unit without code blue team

2015 Advanced Cardiac Life Support (ACLS)
energy recommendations for synchronized cardioversion.

NOTE: SHR utilizes Biphasic Defibrillators (i.e.LifePak 20e, LifePak 15) Adult

	Synchronized cardioversion starting energy level **Biphasic** If initial shock fails increase energy level in a stepwise fashion
Unstable atrial fibrillation	120 - 200 J
Unstable monomorphic ventricular tachycardia	100 J
Other unstable SVT/atrial flutter	50 - 100 J