



1. Purpose

The purpose of this policy is to establish minimum practice standards for the care and management of patients requiring Cardioversion throughout the WA Country Health Service (WACHS).

This CPS will refer to defibrillation electrodes as 'pads' in order to differentiate between ECG monitoring electrodes to confirm heart rhythm and any significant changes pre and post cardioversion.

This policy is to be used in conjunction with WACHS <u>Procedural Sedation –</u> <u>Emergency Department Clinical Practice Standard.</u>

2. Scope

All medical, nursing/midwifery staff employed within the WACHS within the acute care setting/emergency department and all medical students in those areas.

All health care professionals and applicable students are to work within their scope of practice appropriate to their level of training and responsibility.

Further information may be found via <u>HealthPoint</u> or the <u>Australian Health Practitioner</u> <u>Regulation Agency</u>.

3. Considerations

- Elective and urgent cardioversion is only performed by or under the direction of a medical officer (MO)
- Defibrillator operator must be competent in the use of the specific defibrillator being used
- Patients who have been in AF >48 hours should not be treated by cardioversion (electrical or chemical) until they have been anticoagulated or thrombus excluded with appropriate imaging
- Therapeutic anti-coagulation therapy for at least 4 6 weeks is required for patients undergoing elective cardioversion for stable arrhythmias >24-48 hours duration
- Digoxin toxicity (liaise with WA Poisons Information Centre [WAPIC] on 131126 for referral to the on call clinical toxicologist; consider treatment with Digifab)
- Hypokalaemia (treat electrolyte imbalance first Potassium 4mmol/L, Magnesium 1.0mmol/L)
- Previous anaesthetic problems
- Patients with difficult airways on assessment

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- Presence of thrombus in the left atrial appendage
- Chest trauma or chest burns may make it difficult to apply defibrillator pads.

4. General Information

Cardioversion is an elective or urgent procedure used to correct tachyarrhythmia (such as atrial tachycardia, atrial flutter, atrial fibrillation and symptomatic VT).



Cardioversion involves shock applied in a synchronized manner to the cardiac cycle (on the R wave of the QRS complex to terminate the dysrhythmias). Synchronised cardioversion is shock delivery that is timed (synchronised) with the QRS.⁶ This synchronisation avoids shock delivery during the relative refractory period of the cardiac cycle, when a shock could induce ventricular fibrillation (VF). Also known as the R-on-T phenomenon. ^{7 1,4,8,9}



This is different from unsynchronized defibrillation as used in ventricular fibrillation.¹⁰ Most elective or non-emergency cardioversions are performed to treat atrial fibrillation or atrial flutter, heart rhythm disturbances originating in the upper chambers (atria) of the heart.

Cardioversion is also used in emergency situations to correct a rapid abnormal rhythm such as ventricular tachycardia (VT) or a supraventricular tachycardia (SVT) associated with haemodynamic compromise characterised by faintness, low blood pressure, chest pain or difficulty breathing.¹⁰

5. Indications for Procedure

Patients that require cardioversion may be elective or urgent:

- Elective outpatient (Performed in Operating Theatre or DPU or Emergency Department)
- Inpatient or ED patient with new or existing arrhythmia
 - o Haemodynamically stable
 - o Haemodynamically unstable

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Indications for elective cardioversion:

• Haemodynamically stable patients to electively restore sinus rhythm (SR) from atrial fibrillation (AF), atrial flutter or supraventricular tachycardia (SVT)

NB. The presence of atrial or ventricular thrombus must be excluded if the arrhythmia is suspected of being present for greater than 48 hours and the management is non-urgent.¹¹ The presence of thrombus increases the risk of embolic cardiovascular accident post cardioversion as the thrombus can enter the arterio-venous blood circulation. Anticoagulation reduces the risk of thromboembolic events during cardioversion.¹

Indications for urgent cardioversion:

Any patient with ventricular tachycardia or a tachyarrhythmia who is haemodynamically unstable.

Signs of instability may include, but are not limited to:

- Reduced conscious level
- Chest Pain
- Heart Failure
- HR >150bpm
- Systolic BP <90mmHg

In an urgent cardioversion, the clinical status of the patient will determine if time permits for pre procedure investigations.

6. Clinical Communication

Clinical Handover

Information exchange is to adhere to the Department of Health Clinical Handover Policy using the iSoBAR framework.

Critical Information

Critical information, concerns or risks about a consumer are communicated in a timely manner to clinicians who can make decisions about the care.

Documentation

Individualised management plan to be documented in the patients' health records as soon as is practicable. At a minimum the plan must consider:

- Diagnosis & indications for cardioversion
- Allergy history
- Any restriction to intervention associated with Advanced Health Directives, Advance Care Plan and/or MR00h.1 State Goals of Patient Care Summary form

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- Physiological observations pre and post procedure
- Document sedation procedure details
- Position of pads/paddles on chest
- Type of cardioversion or defibrillation used:
 - Synchronised or unsynchronised
 - Biphasic or monophasic
- Time of synchronised shock(s)
- Number of shocks and joules delivered
- Response to cardioversion
- Pre and post procedure ECG performed
- Condition of patient post procedure
- Condition of the skin following cardioversion
- Any unexpected events which occurred during the cardioversion
- Haemodynamic observations and conscious state
- Post procedure instructions
- Document any changes and inform MO
- Frequency of observations, in the absence of site specific protocol.

Patient/Carer information

Explain:

- Requirement for observations and 12 Lead ECG pre and post procedure
- Requirement to report pain or nausea post procedure
- Patient should not drive or operate machinery, or sign any important documents for 24 hours after receiving an anaesthetic/sedation and to be in the company of a responsible adult (for patients who are discharged post cardioversion).

There are a number of ways patients and carers can obtain specific information relating to hospital admissions, transfers and discharge from hospital. Relevant documents can be located via:

- Procedure Specific Information Sheets (PSIS) CAO5 External Cardioversion
- Emergency Discharge Information Sheet WA Health Adult Cardioversion

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Patient Preparation

In urgent situations the patient may have limited opportunity to ask questions and preparation may be modified.

- Patient identification and procedure matching processes are undertaken
- To maintain patient privacy and dignity
- Provide the opportunity for an accredited interpreter and/ or Aboriginal Liaison Officer where appropriate to the patient's language or communication requirements (refer to WA Health Language Services Policy)
- Place patient in a short sleeved patient gown that allows easy access to chest this may not be appropriate for urgent cardioversion or critically ill patients
- Complete site specific pre procedure documentation
- Clip any excessive hair from chest to improve adherence of defibrillation pads to skin
- Ensure consent form is completed
- Remove or avoid pad placement over jewellery as metal jewellery may conduct electrical current resulting in a burn to the patient
- Encourage patient to void pre procedure so as to reduce the risk of incontinence while under the effect of anaesthesia
- Dentures are to remain with the patient at all times. Remove ill-fitting or as per anaesthetic/MO instructions
- Ensure patient/ carer/ significant other (if applicable) understands the procedure by providing verbal information and any written advice that is available
- Prepare resuscitation equipment in the cardioversion procedural area
- Ensure patient's bed/procedure trolley is dry and moisture is dried from chest
- Ensure patient has patent IV access (peripheral or central access may be used)
- Perform and document baseline pre procedure physiological observations, weight and ECG on the appropriate form/chart
- MO to advise regarding withholding of cardio active drugs e.g. anti-arrhythmic and antihypertensive drugs
- Apply O2 as per MO orders. Consider O2 devices with End Tidal Carbon Dioxide (ETC02) monitoring where facilities exist

7. Pre-Procedure Key Points

Fasting

- Fast patient prior to procedure
- Refer to: WACHS Pre and Post Procedural Management Clinical Practice Standard

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- For urgent cardioversion, patient may not have been fasted
 - Inform MO if patient is not fasted
 - Medications to promote gastric emptying may be prescribed

Investigations (Elective Cardioversion)

- The presence of atrial or ventricular thrombus must be excluded if the arrhythmia is suspected of being present for greater than 24 48 hours and the management is non-urgent. Patients should be therapeutically anti-coagulated for 4-6 weeks prior to cardioversion or appropriate imaging performed to exclude presence of atrial or ventricular thrombus.
- INRs need to be tested during this period to ensure that it has been above 2.0 for the entire period. Alternatively a Direct Oral Anticoagulant (DOAC) can be used for at least 4 weeks (ensuring that there have been no missed doses).
- 12 Lead ECG
- Consider transthoracic echocardiogram, to determine heart structurally normal, and Holter monitoring; if appropriate prior to undertaking cardioversion
- Confirm patient pregnancy status. Inform MO if patient pregnant or pregnancy suspected
- Blood tests as appropriate e.g. urea, creatinine, electrolytes, Mg, Ca, FBC, specific drug levels, INR if on Warfarin. Antiarrhythmic drugs/abnormal electrolyte levels can alter defibrillation threshold.12

Elective Cardioversion in patients with Implantable Devices

Devices are:

- Pacemakers
- Cardiac defibrillators internal or subcutaneous
- Loop Recorders e.g. Reveal Devices

Pre-procedure discussion with the patient's cardiologist needed to ascertain any particular management considerations.

These patients may be booked for cardioversion at a centre where technicians and programmers for implantable devices are available, if practicable.

Scientific officer (Technician) and or programmer may need to be booked prior to elective cardioversion as appropriate.

Scientific officer (technician) and/or programmer need to be scheduled for postprocedure review at an appropriate time to ensure correct device operation following cardioversion.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Placement of ECG monitoring electrodes and Defibrillator Pads/Paddles

Apply 3 or 5 lead cardiac monitoring

Ensure electrodes are not in contact with defibrillator pads

Cardiac monitoring leads to be connected to defibrillator so as to ensure synchronisation with QRS complex

Defibrillator pads or paddles may be used for cardioversion/defibrillation as appropriate and as determined by the MO.

Defibrillator pads or paddles may be placed anterior-lateral or anterior-posterior at the direction of the MO.

The defibrillator pads should be placed on the patient prior to the anaesthetic being administered. Conscious patients may be able to assist in moving and positioning for the placement of anterior – posterior defibrillation patch placement. Defibrillation pads are applied with a rolling motion to prevent air being trapped beneath.

Defibrillator pads should be appropriate size for the patient – with larger pads generally more effective than smaller size pads.

Defibrillator pads must not be placed over:

- ECG electrodes
- Medication patches e.g. Glycerine Trinitrate (GTN) or fentanyl
- Implantable device such as a Permanent Pacemaker (PPM) should be a minimum of 8cm away1, 3
- Jewellery
- Intravenous (IV) or central venous catheter (CVC) tubing
- Dressing or suture line

Transthoracic current flow is influenced by:

- Pad size and placement
- Phase of ventilation (end expiration has a lower impedance than inspiration)
- Distance between pads
- Patient body mass index (BMI)
- Body hair

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- Myocardial tissue and conductive properties
- Energy level
- Monophasic or biphasic shock
- Medications such as amiodarone, lignocaine.
- Sedation
- Electrolyte imbalance1

Anterior-Lateral Defibrillation Pad Placement

Place pads on the exposed chest in an anterior-lateral position, unless advised otherwise by MO or clinically appropriate to do so. In large breasted individuals it is reasonable to place the left electrode pad lateral to or underneath the left breast avoiding breast tissue.³ Defibrillator pads must not be touching each other.

Anterior-Posterior Placement

The anterior-posterior placement is preferred in patients with implantable devices – and ensuring at least 8cm distance from the implanted device, in order to avoid shunting current to the implantable device and damaging the system.^{1,2,3,4}

The MO may prescribe anterior-posterior pad placement if patient has a history of difficult previous cardioversion, previous requirement for high-energy joules for cardioversion or obesity/ large body size or for other clinical reason.

Low energy joules are used where possible, to avoid damage to the implantable device or PPM. The implantable device or PPM must be checked post cardioversion by a cardiac technician at an appropriate time.

If either anterior-lateral or anterior-posterior is unsuccessful it may be appropriate to relocate pads to the other position for further cardioversion attempt/s.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Infection Control Considerations

Staff are to comply with the specific requirements for hand hygiene, aseptic non-touch technique and personal protective equipment, in alignment with the WACHS Infection Prevention and Control Policy.

8. Staffing Requirements

- Staff are required to maintain the minimum level of competency that is required for their role and work within their scope of practice
- Staffing levels for cardioversion to be undertaken safely are appropriate for the clinical condition of the patient
- A minimum number of three appropriately trained staff should undertake the procedure:
 - There must be a dedicated airway doctor the airway doctor must be competent in procedural sedation
 - The proceduralist must be a separate practitioner
 - One additional nursing or medical staff member with advanced life support currency to provide assistance to the above.
 - Refer to: WACHS Procedural Sedation Emergency Department Clinical Practice Standard
 - Operating theatre will be required to follow local processes in line with ACORN Standards.
- Defibrillator operator must be competent in Advanced Life Support and for the specific defibrillator being used
- MO performing or guiding the cardioversion must work within their identified scope of practice, ensuring that they have appropriate training and experience in cardioversion.
- Medical students are able to perform cardioversion only with direct supervision of a competent MO (refer to above point)
- An Enrolled Nurse (EN)/Registered Nurse (RN) competent in manual defibrillation may deliver the cardioversion shock under the direct supervision of the credentialed MO. Undergraduate nurses are not permitted to perform cardioversion – even under MO supervision.

9. Procedural Environment for Elective Cardioversion

Ensure area safe for procedure including:

- Operating theatre or DPU or ED
- Clearly accessible and free of obstacles
- Emergency equipment present and in working order
- Ensure suction available and effective function tested prior to procedure
- Place patient on a trolley/bed that can be tipped head down
- Ensure patient is not touching metal surface e.g. bed rail.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

10. Equipment Required

- Defibrillator with continuous 3 lead ECG monitoring, ECG print out, pacing controls and synchronising capacity.
- Emergency resuscitation trolley: Airway management equipment: Airway adjuncts (naso and/or oropharyngeal), Bag-Valve-Mask and tubing
- Intravenous (IV) sedation and/or analgesia and anaesthetic agents as prescribed by MO on WA Hospital Medication Chart
- Oxygen and suction equipment
- Pulse oximetry with appropriate low alarms set
- Blood Pressure measuring equipment (Manual or invasive monitoring equipment)
- Defibrillation pads (Check expiry date)
- 12 Lead ECG machine available (The 12 lead ECG machine should not be attached to the patient during cardioversion)
- Intravenous cannulation equipment (including large bore IV cannula)
- Capnography (EtCO2) & FiO2 monitoring equipment as available

In Addition:

- Equipment must be appropriate for the age/size of the patient
- Equipment must be serviced and calibrated in accordance with manufacturer's recommendations to ensure reliability and accuracy Minimum daily visual inspection and Code Readiness Test.

11. Potential Problems during Procedure

Complications of cardioversion are rare, however Cardioversion carries a risk, including:

- Aspiration
- Thrombo-embolism
- CVA/Stroke
- Development of a life threatening arrhythmia Heart Block, Asystole, VT/VF
- Hypoxia/hypoventilation from sedation
- Myocardial necrosis
- Myocardial dysfunction
- Pulmonary oedema
- Skin burn Avoid the use of lignocaine gel or creams on burns as lignocaine gel has the potential to induce serious toxicity (anti arrhythmic) with systemic absorption. Creams/gel can leave a thin film on skin surface, making it more

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

difficult for application of self-adhesive electrodes and increased thoracic impedance if further cardioversion is required

• Hypotension.

If any off these occur follow the Advanced Life Support (ALS) Algorithm and escalate care.

Refer to: WACHS Clinical Escalation of Acute Physiological Deterioration including Medical Emergency Response

12. Procedure Key Points

- The amount of energy used to cardiovert a patient should be determined by the MO dependent on the arrhythmia being treated
- Refer to Appendix 1: ZOLL Medical Series Defibrillator Start Up
- Ensure proper operation of the defibrillator, and in particular:
 - \circ $\;$ The defibrillator is turned on
 - Manual operation is selected
 - o Synchronisation is selected
 - Appropriate energy is selected
- Confirm with MO patient is adequately sedated and prepared for procedure
- Ensure free flowing oxygen is a minimum of 1 meter from the defibrillation pads and removed prior to administering the shock
- Reconfirm rhythm prior to delivering electrical current to patient
- Confirm rhythm after shock has been delivered
- Administer further DC shocks as required or prescribed by the MO
- If cardioversion is unsuccessful, nursing staff to liaise with MO for clinical management plan
- MO may prescribe intravenous anti-arrhythmic medication therapy and may reattempt cardioversion if patient is significantly haemodynamically compromised
- If sinus rhythm is restored the procedure is concluded. If repeat cardioversion is necessary, the procedure can be repeated as determined by the MO
- Assess patient after each shock is delivered, including airway, breathing and circulation. If deterioration of patient condition is noted follow ALS algorithm. If patient requires emergency defibrillation ensure synchronisation button is switched off.

13. Procedure¹²

- Switch power on
- Set defibrillator to manual mode
- Press synchronise "Sync" button

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- Ensure synchronise function is active by confirming presence of indicator above each QRS complex
- An acceptable QRS complex must be identified for energy to be delivered. This permits the defibrillator to synchronise with the "R" or "S" wave. The defibrillator in synchronised mode automatically discharges an electrical current timed to the appropriate ECG phase
- If the defibrillator fails to sense the QRS complex when synchronised cardioversion is performed, the device will not discharge the electrical energy
- The following techniques may be used in the event of failure to sense the QRS complex
- Increase the QRS amplitude on the monitor, using the size button (make sure that this does not cause the T wave to be sensed as the QRS complex)
- Use the lead button to select a lead with a higher QRS amplitude
- Confirm with MO when the patient is adequately sedated and prepared for the procedure
- Set energy level as per MO instruction using energy select
- Confirm energy level selected/displayed on the screen as per MO instruction
- Press "charge" and wait for "ready" display tone
- Ensure operator stands on dry surface and stands clear of patient and bed
- Ensure no persons have direct or indirect contact with the patient and bed when discharging and state "STAND CLEAR"
- Ensure free flowing oxygen is a minimum of one metre from the defibrillation pads and removed prior to administering the shock.
- Press and hold "shock button" as per MO instruction
- Keep "shock button" depressed until shock has been delivered. The operator must anticipate the slight delay between pressing the shock button and delivery of the shock when the next "R" wave occurs
- Confirm rhythm after shock has been delivered

- Administer further DC shocks as prescribed by MO
- Reactivate SYNC function if further cardioversion shocks are required by pressing the SYNC button Unit automatically exits SYNC after each shock
- Press energy select to increase energy to be delivered as prescribed by MO
- If Cardioversion is unsuccessful, liaise with MO as to further management plan. MO may prescribe intravenous anti-arrhythmic medication therapy and may reattempt cardioversion if patient is significantly haemodynamically compromised

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

- Assess patient after each shock is delivered, including airway, breathing and circulation. If deterioration of patient condition is identified follow Advanced Life Support Algorithm
- If the patient requires emergency defibrillation for VF ensure SYNC button is switched off.

14. Post Procedure

Physiological Observations:

- Conscious state
- Respiration rate and SpO2
- Cardiac rhythm and pulse
- Blood pressure
- Evidence of pain and/or skin burns
- Full neurological observations
- If appropriate, ensure implantable device or PPM is functioning appropriately. Scientific officer (technician) or programmer may need to review device settings.

Frequency of observations

Patient to be monitored in high acuity area (ED, Recovery, High Dependency/ICU with a minimum of 30 mins with 1:1 nursing care with ALS trained staff and access to a defibrillator.

Patients require post-sedation/procedure physiological observations:

- Cardiac monitoring to continue until advised by MO
- Physiological Observations
 - 5 minutely until patient alert
 - \circ $\,$ 15 minutely and prn for 30 min $\,$
 - 30 minutely and prn for 1-2 hours
 - 1 hourly or as clinically indicated.

12 lead ECG:

• Obtain ECG post procedure and compare with pre procedure ECG by MO.

Diet and Fluids:

- As patients medical condition allows
- Once gag reflex has returned and patient fully awake.

15. Discharge

The doctor managing the patient's airway should remain on site until patient recovers from procedural sedation.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Length of stay for post procedural patient will be dependent on clinical condition post cardioversion:

- For Emergency Departments discharge criteria refer to WACHS Procedural Sedation Emergency Department Clinical Practice Standard.
- Operating theatre (including DPU) will be required to follow local processes in line with ACORN Standards
- Refer: ANZCA <u>Guidelines on Sedation and/or Analgesia for Diagnostic and</u> <u>Interventional Medical, Dental or Surgical procedures</u>

16. Compliance Monitoring

Evaluation, audit and feedback processes are to be used to monitor compliance.

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the <u>Integrity Policy Framework</u> issued pursuant to section 26 of the <u>Health Services Act 2016</u> (WA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

17. Records Management

Health Record Management Policy

18. Relevant Legislation

(Accessible via: <u>Western Australian Legislation</u> or <u>ComLaw</u>) sites)

- Carers Recognition Act 2004 (WA)
- Disability Services Act 1993 (WA)
- Equal Opportunity Act 1984 (WA)
- Equal Opportunity Regulations 1986 (WA)
- Guardianship and Administration Act 1990 (WA)
- Health Practitioner Regulation National Law (WA) Act 2010
- Medicines and Poisons Act 2014 (WA)
- Medicines and Poisons Regulations 2016 (WA)
- Mental Health Act 1996 (WA)
- Occupational Safety and Health Act 1984 (WA)
- Occupational Safety and Health Regulations 1996 (WA)
- Pharmacy Act 2010 (WA)
- Privacy Act 1988 (Commonwealth)
- Public Sector Management Act 1994 (WA)
- State Records Act 2000 (WA)

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

19. Relevant Standards

National Safety and Quality Health Service Standards 8.1, 8.3, 8.4, 8.8, 8.9, 8.10, 8.11, 8.13

20. Related WA Health Policies

MP0095 Clinical Handover Policy

MP0086/18 Recognising and Responding to Acute Deterioration Policy

MP0053/17 WA Clinical Alert (Med Alert) Policy

OD0657/16 WA Health Consent to Treatment Policy

MP0051/17 WA Health Language Services Policy

21. Related WACHS Documents

<u>Clinical Escalation of Acute Physiological Deterioration including Medical Emergency</u> <u>Response (MER) Policy</u> Clinical Observations and Assessment Clinical Practice Standard (physiological,

neurovascular, neurological and fluid balance)

Documentation Clinical Practice Standards

Infection Prevention and Control Policy

Pre and Post Procedural Management Clinical Practice Standard

Procedural Sedation Emergency Department Clinical Practice Standard

MR00H.1 State Goals of Care Summary

MR12 WACHS Emergency Department Procedural Sedation Record

MR140A Adult Observation and Response Chart (A-ORC)

22. WA Health Policy Framework

Clinical Governance, Safety and Quality Framework

23. Acknowledgement

Acknowledgment is made of the previous SMHS / WACHS site endorsed work used to compile this Cardioversion Clinical Practice Standard.

Acknowledgement for this version is made to Tony Mylius (Cardiologist) and Nigel Sinclair (Cardiologist).

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

24. References

- 1. Australian Resuscitation Council and New Zealand Resuscitation Council. Guideline 11.4: Electrical therapy for adult advanced life support. *Australian Resuscitation Council Guidelines*. Melbourne, VIC: ARC; 2010.
- **2.** Australian Resuscitation Council. *Advanced life support manual.* Melbourne, VIC: ARC; 2011.
- **3.** Australian Resuscitation Council. Guideline 7: Automated external defibrillation (AED) in basic life support (BLS). Melbourne, VIC: ARC; 2011: <u>http://www.resus.org.au/</u>.
- Deakin CD, Nolan JP, Sunde K, Koster RW. European Resuscitation Council Guidelines for Resuscitation 2010 Section 3. Electrical therapies: automated external defibrillators, defibrillation, cardioversion and pacing. *Resuscitation*. Oct 2010;81(10):1293-1304.
- 5. Gibson T. A practical guide to external direct current cardioversion. *Nursing standard* (*Royal College of Nursing (Great Britain) : 1987).* May 21-27 2008;22(37):45-50.
- 6. Knight BP. Cardioversion for specific arrhythmias. *UpToDate*. Waltham, MA: Basow, DS; 2012.
- **7.** Ranse J, Luther M, Sargent L. R-on-T resulting in ventricular fibrillation post elective cardioversion: a case study. *Australasian Emergency Nursing Journal.* 2009;12(3):120-122.
- Link MSA, D.L.; Passman, R.S.; Halperin, H.R.; Samson, R.A.; White, R.D.; Cudnik, M.T.; Berg, M.D.; Kudenchuk, P.J.; Kerber, R.E. Part 6: Electrical therapies : Automated external defibrillators, defibrillation, cardioversion, and pacing. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Dallas, TX: American Heart Association; 2010.
- **9.** Beinart SC. Synchronized electrical cardioversion. *eMedicine*. New York: Medscape; 2011.
- **10.** Jayasekara R. Cardioversion: Clinician Information. Adelaide, SA: The Joanna Briggs Institute; 2012: JBI Connect [Accessed 9 January 2013]
- **]11.**Xue Y. Electrical cardioversion. Adelaide, SA: The Joanna Briggs Institute; 2010: JBI Connect [Accessed 9 January 2013]
- ZOLL R Series Plus Operators Guide <u>https://api.zoll.com/-/media/public-site/products/r-series-defibrillators/9650-0904/9650-0904-01-sf_v.ashx</u> [Accessed 19/07/19]
- Western Australia. Department of Health. Clinical handover policy. Operational directive OD 0403/12. Perth, WA: Department of Health; 2012: <u>http://www.health.wa.gov.au/circularsnew/circular.cfm?Circ_ID=12912</u> [Accessed 16 January 2013]
- 14. Western Australia. Department of Health. Clinical incident management policy. Operational directive OD 0341/11. Perth, WA: Department of Health; 2011: <u>http://www.health.wa.gov.au/circularsnew/circular.cfm?Circ_ID=12820</u> [Accessed 16 January 2013]
- Fiona Stanley Hospital. Nursing Practice Standard: Cardioversion Management of the Elective and Urgent. <u>https://healthpoint.hdwa.health.wa.gov.au/policies/FSH%20Policies/Cardioversion%20</u> <u>Management%</u>20of%20Elective%20and%20Urgent%20NPS.pdf [Accessed 03/02/2015]

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

25. Definitions

Carer	A person who provides personal care, support and assistance to another individual who needs it because they have a disability, a medical condition (including a terminal or chronic illness) or a mental illness, or are frail and/or aged
Patient	A person who is receiving care in a health service organisation

26. Appendix

Appendix 1: ZOLL Medical R Series Plus, ALS & BLS – Start Up

This document can be made available in alternative formats on request for a person with a disability

Contact:	Program Officer Clinical Practice Standards (R. Phillips)		
Directorate:	Medical Services – Safety & Quality	EDRMS Record #	ED-CO-15-92677
Version:	3.01	Date Published:	15 September 2020

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the *Copyright Act 1968*, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Appendix 1: ZOLL Medical R Series plus, ALS & BLS – Start Up¹²

The R Series system in the MANUAL MODE is indicated for Synchronized Cardioversion.

1. Select ON

The unit beeps 4 times to indicate that it has passed the power on self test and the green AED label and the ON mode selector light up on the front panel.

Press the **Manual Mode** softkey on the front panel of the unit to enter the Manual mode of operation.

The message *CONFIRM MANUAL MODE* and the **Confirm** softkey will be displayed. Press the **Confirm** softkey to enter the Manual mode of operation. If the **Confirm** softkey is not pressed within 10 seconds, the unit will revert back to AED operation.

Note: If the unit has been configured not to confirm the transition from AED mode to Manual mode, the unit will immediately enter Manual mode.

The control buttons for Manual mode light up on the front panel. Select the desired energy using the up and down arrow keys on the front panel (or sternum paddle if using paddles).

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

Press Sync On/Off softkey, then press the Remote Sync Softkey

The selected energy level is displayed on the monitor.

The words "REMOTE SYNC" are displayed in place of the ECG trace, and a *REMOTE SYNC XXXJ SEL*. message appears on the display.

The ECG heartbeat indicator will flash with each synchronization pulse received from the remote monitoring device.

Unless otherwise configured, the unit automatically exits Sync mode after each shock, and if the Mode Selector is moved to **OFF**.

Press the **Sync On/Off**, **Remote Sync** softkey sequence again to reactivate Remote Sync mode. Changing the selected energy levels does not cause the unit to leave Remote Sync mode.

View the ECG trace on the remote device's display. Verify that Sync markers appear with each R-wave. The Sync markers will appear as described in the remote device's user manual.

WARNING! Verify the ECG waveform is stable and that a Sync marker appears only with R-waves. If Sync markers are not present on the remote device display, or do not appear to be nearly simultaneous with each R-wave, do not proceed with synchronized cardioversion.

2 Charge Defibrillator

Press the CHARGE button on the front panel or, if using paddles, on the apex paddle handle.

To abort charging and increase or decrease the selected energy after the **CHARGE** button has been pressed, use the **ENERGY SELECT** buttons on either the defibrillator front panel or the sternum paddle. Press the **CHARGE** button again to charge the unit.

After charging the unit to the selected energy, either the front panel **SHOCK** button or, the apex paddle charge indicator illuminates. A distinctive audible tone sounds and the energy ready *REMOTE SYNC XXXJ READY* message is displayed.

The defibrillator is now ready to deliver therapy.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.

3 Deliver SHOCK

WARNING! Warn all persons in attendance of the patient to STAND CLEAR prior to defibrillator discharge.

Verify that no one is in contact with the patient, monitoring cable or leads, bed rails, or any other potential current pathways.

Press and hold the illuminated **SHOCK** button on the front panel, or simultaneously press and hold both paddle **SHOCK** buttons until energy is delivered. The defibrillator will discharge with the next remote synchronization pulse.

Note: If the defibrillator is not discharged within 60 or 120 seconds (user configurable) after reaching the selected energy level, the unit automatically disarms itself. During the ten seconds prior to this internal disarm, the charge ready tone beeps intermittently. The charge ready tone then stops and the defibrillator remains in Remote Sync mode.

Once the energy is delivered, the display simultaneously shows *XXXJ DELIVERED* and *DEFIB XXXJ SEL*. After approximately 5 seconds, the *XXXJ DELIVERED* message disappears and the *DEFIB XXXJ SEL*. message remains to indicate the selected energy level.

If additional countershocks are necessary, readjust the energy level as necessary, press the **Sync On/Off**, and then the **Remote Sync** softkeys and repeat. Note that *REMOTE SYNC XXXJ SEL* must be displayed prior to pressing the **CHARGE** button.

If the **ANALYZE** button is pressed while the unit is in Remote Sync mode, the unit displays the *REMOVE SYNC* message and disallows ECG rhythm analysis until the unit is taken out of Sync mode.

Printed or saved electronic copies of this policy document are considered uncontrolled. Always source the current version from <u>WACHS HealthPoint Policies</u>.