Clinical Practice Procedures:
Cardiac/Synchronised cardioversion

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<th>CPP_CA_SC_1222</th>
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<td>Date</td>
<td>December, 2022</td>
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<td>Purpose</td>
<td>To ensure a consistent procedural approach to synchronised cardioversion.</td>
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<td>Scope</td>
<td>Applies to Queensland Ambulance Service (QAS) clinical staff.</td>
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<td>Health care setting</td>
<td>Pre-hospital assessment and treatment.</td>
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<td>Population</td>
<td>Applies to all ages unless stated otherwise.</td>
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<td>Source of funding</td>
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**Synchronised cardioversion** is a method of restoring the normal rhythm of the heart in patients presenting with a rapid ventricular rate associated with severely compromised cardiac output (e.g. ALOC, SBP < 90 mmHg, chest pain, heart failure).\(^{[1-4]}\)

This is achieved using a purpose modified defibrillator capable of delivering a direct current countershock, synchronised on the R-wave of the ECG.\(^{[5]}\)

**Synchronised**

\[x1.0 \ 25\text{mm/sec}\]

**Not synchronised**

\[x2.0 \ 25\text{mm/sec}\]
Procedure – Synchronised cardioversion

1. Explain the procedure to the patient.
2. Establish IV access with a sodium chloride 0.9% running line.
3. Ensure resuscitative drugs are available.
4. Prepare airway, suction and ventilation equipment.
5. Consider sedation as per CPG: Procedural sedation, ensuring the patient is well oxygenated prior to and following sedation and cardioversion.
6. Position ECG electrodes (refer to CPP: Cardiac monitoring).
7. Position defibrillation electrodes in the anterior-lateral position (all patient ages).

Indications

Rapid ventricular rate with severely compromised cardiac output, in the following cardiac rhythms:\(^2\)
- Pulsatile ventricular tachycardia
- Supra-ventricular tachycardia
- Atrial fibrillation
- Atrial flutter

CAUTION: Cardioversion of SVT including Atrial Fibrillation and Atrial Flutter is rarely required in the pre-hospital setting.

Contraindications

- VF/pulseless VT
- Dysrhythmias where the patient is adequately perfused

Complications

- Pain and discomfort
- Paradoxical asystole or VF

Anterior-lateral defibrillation pad placement
**Procedure – Synchronised cardioversion**

**corpus**: For comprehensive instruction refer to the corpus operating instructions.

1. Ensure the defibrillator is in manual mode. If not press the Manual key.
2. Observe the ECG rhythm, ensure appropriate location of the sense markers.
3. Select the required energy level with the jog dial or via the soft keys.
4. Press the Charge key to charge the defibrillator.
5. Once charged, hold the key to deliver the synchronised cardioversion to the patient.
6. Confirm that the synchronised cardioversion has occurred by SHOCK PERFORMED being displayed on the screen.
7. Assess patient following cardioversion attempt. If VF or asystole occurs immediately manage as per CPG: Cardiac arrest.
8. Perform a maximum of three attempted synchronised cardioversions.

**ZOLL® X Series**: For comprehensive instruction refer to the ZOLL® X Series operating instructions.

1. Press Sync. Observe the ECG rhythm, ensure appropriate location of the sense markers.
2. Select the required energy level with the Select Energy key.
3. Press the Charge key.
4. Once charged, hold the Shock key to deliver the synchronised cardioversion to the patient.
5. Assess patient following cardioversion attempt. If VF or asystole occurs immediately manage as per CPG: Cardiac arrest.
Additional information

- The recommended corpuls3 joule settings for synchronised cardioversion in adults:
  - Shock 1 100 J
  - Shock 2 150 J
  - Shock 3 200 J

- Consultation with the QAS Clinical Consultation and Advice Line is required in all circumstances of paediatric synchronised cardioversion. The requirement for pre-hospital synchronised cardioversion in the paediatric patient is extremely rare. If deemed necessary a recommended sequence at 0.5–1 J/kg increasing to 2 J/kg if required.

- Always consider other possible causes of the tachyarrhythmia such as hypovolaemia.

- Should synchronised cardioversion be unsuccessful, confirm monitoring electrodes and pads are appropriately placed, ensure the synchroniser is on and the R-wave is being sensed, and consider alternative pad placement.