



# Clinical Practice Procedures: Cardiac/Mechanical chest compression device – corpuls cpr

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<b>Date</b>	December, 2024
<b>Purpose</b>	To ensure a consistent procedural approach to mechanical chest compression device – corpuls cpr
<b>Scope</b>	Applies to Queensland Ambulance Service (QAS) clinical staff.
<b>Health care setting</b>	Pre-hospital assessment and treatment.
<b>Population</b>	Applies to all ages unless stated otherwise.
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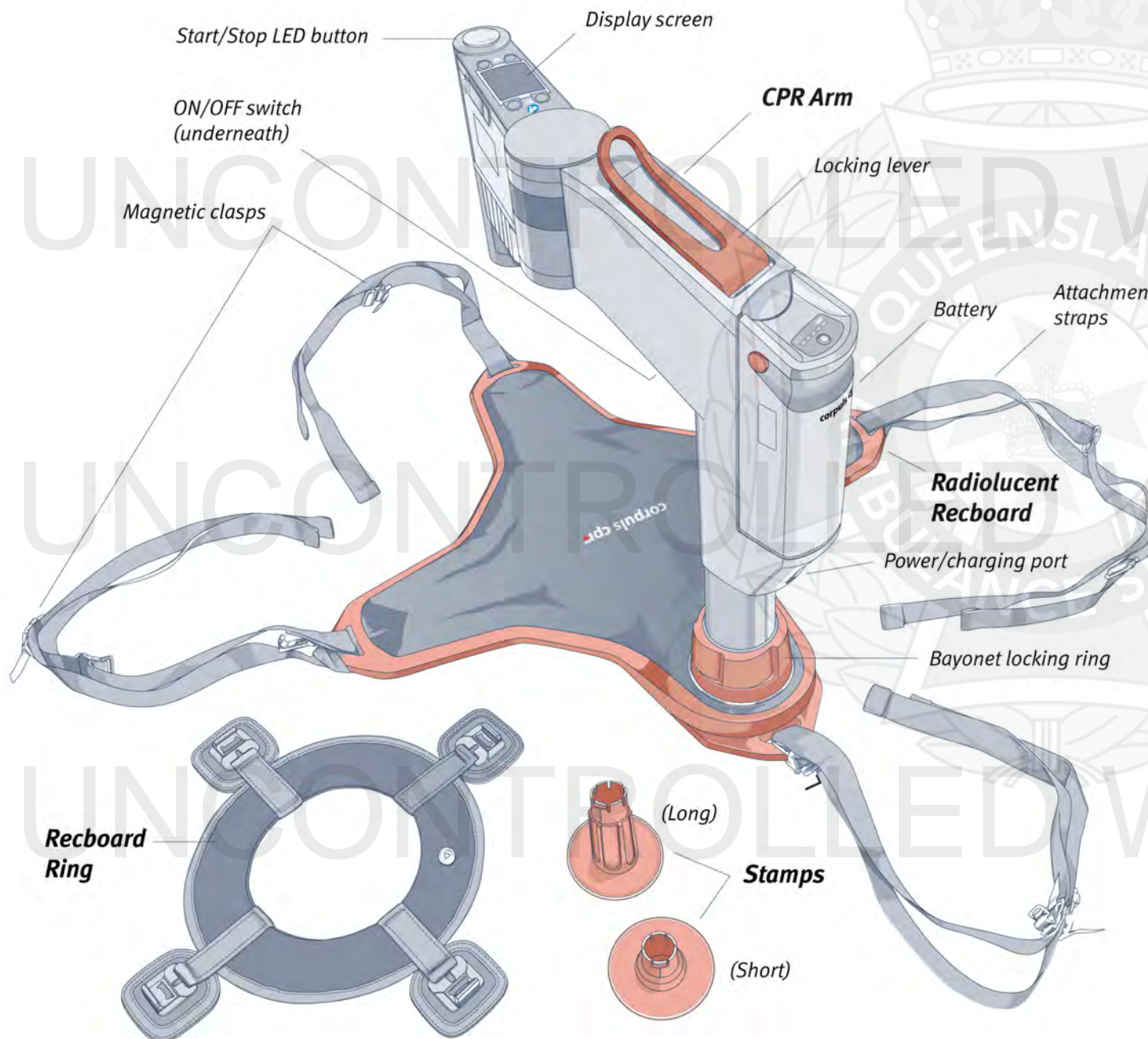
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# Mechanical chest compression device – corpuls cpr

December, 2024

**Mechanical Chest Compression Devices (MCCD)** are automated external cardiac compression machines that when applied correctly deliver effective and consistent compressions to a patient's chest.

The corpuls cpr is a portable MCCD that uses a mechanical piston to deliver external cardiac compressions (ECC).



## Indications



- To facilitate high quality chest compressions

## Contraindications



- Patients less than 18 OR greater than 65 years of age (consultation required)
- Body habitus (too small/large) impeding corpuls cpr function
- When unable to correctly position the compression device on the patient's chest
- Traumatic cardiac arrest

## Complications



- Iatrogenic injury (e.g. skin abrasions, rib fractures, solid organ injury)
- The potential to unnecessarily delay or interrupt manual chest compressions or defibrillation during application



## Procedure – Mechanical chest compression device – corpuls cpr

1. Ensure continued effective manual Cardio-Pulmonary Resuscitation (CPR) during preparation and application.
2. Ensure the patient's chest is free of clothing and jewellery or other obstructions, including the corPatch, ZOLL X Series® or X Series Advanced® CPR sensor, ultrasound gel etc. Defibrillation pads and ECG electrodes should be positioned clear of the anticipated stamp position.
3. Remove the cpr arm, Recboard, stamps, and Recboard ring from the corpuls cpr carry case.
4. Turn on the corpuls cpr arm – the device will power up and conduct a self-test.

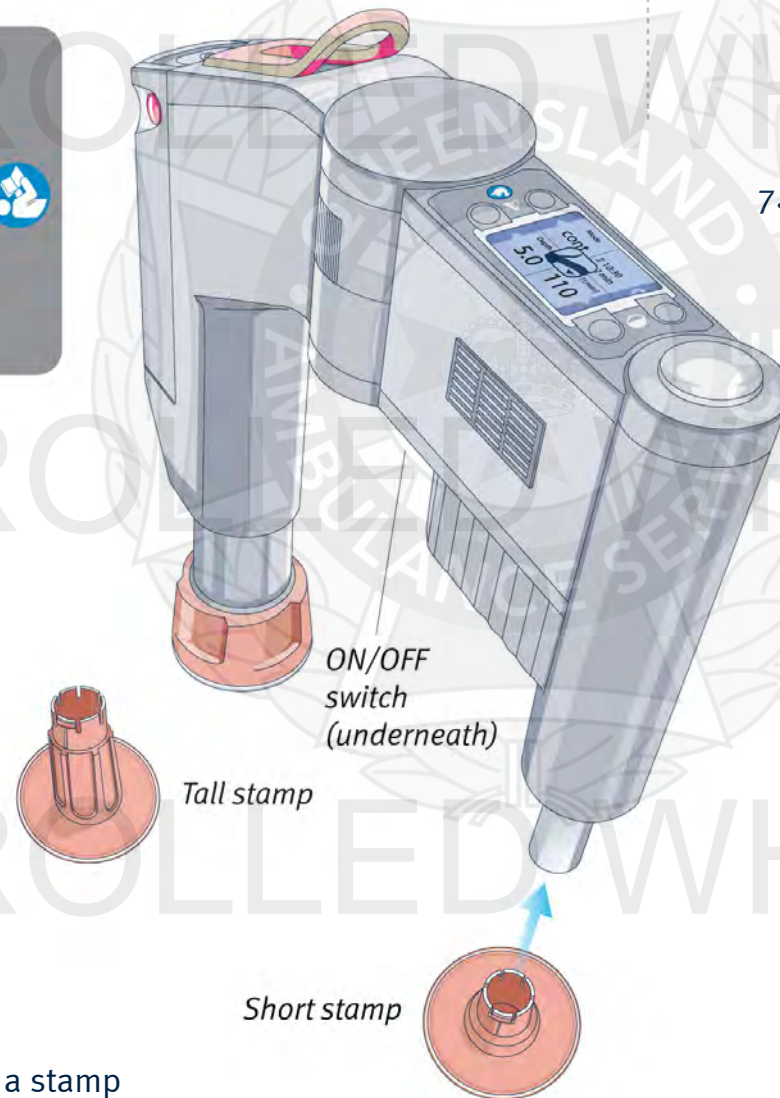


Display screen

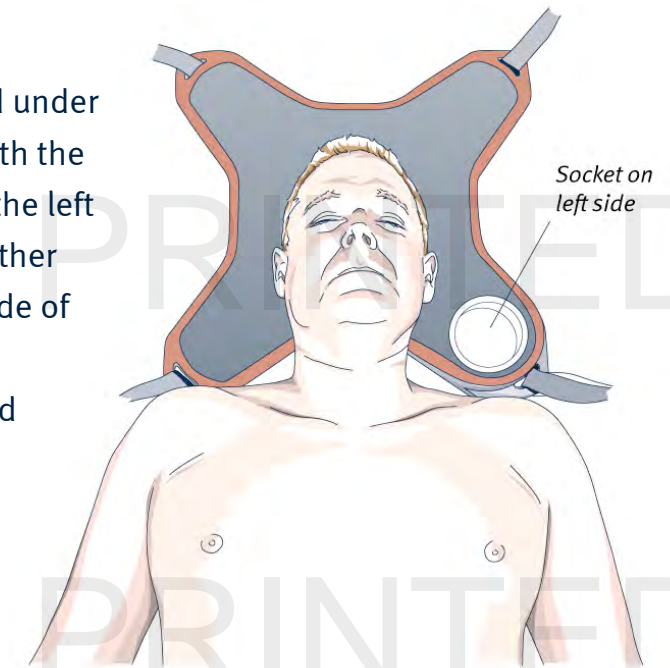
5. Select the appropriately sized stamp for the patient's chest and firmly insert into the arm – a click will be heard when correctly inserted.

- *Short stamp* – for patients with an approximate thorax height of 20–34 cm (most patients).
- *Tall stamp* – for patients with an approximate thorax height of 14–28 cm (smaller patients).

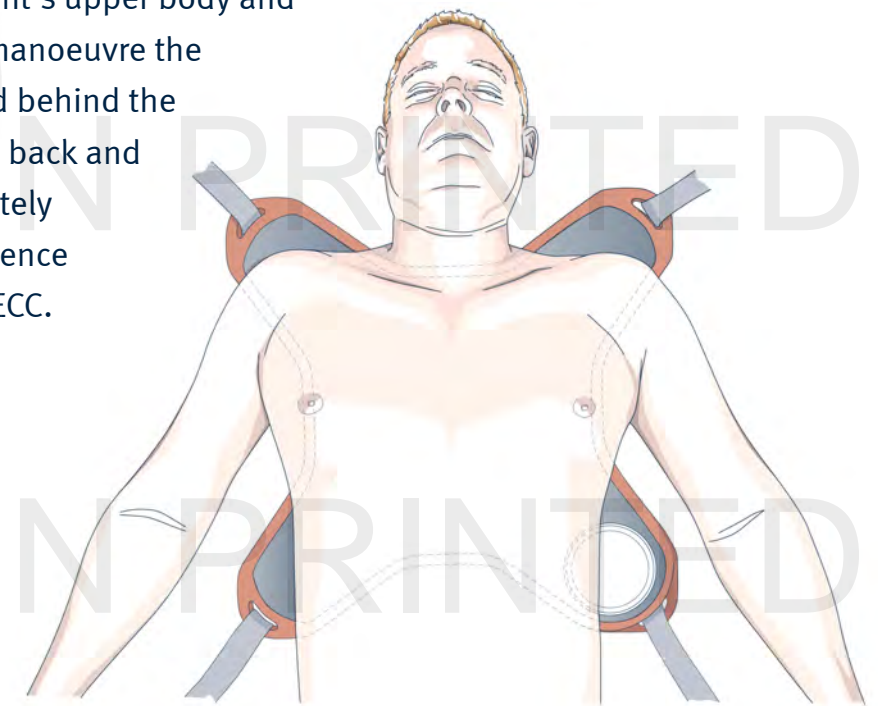
**NOTE: DO NOT** operate corpuls cpr without a stamp fitted, as this may result in serious injuries to the patient.



6. Position the Recboard under the patient's neck, with the Recboard socket, on the left side of the patient, either toward the head or side of the patient. This will facilitate unobstructed access to the patient during transport.



7. With minimal interruption to manual ECC and using a coordinated safe manual tasking approach, slightly elevate the patient's upper body and quickly manoeuvre the Recboard behind the patient's back and immediately re-commence manual ECC.





## Procedure – Mechanical chest compression device – corpuls cpr

8. Insert the base of the cpr arm vertically into the Recboard socket with slight downward pressure. The cpr arm locks automatically.
9. Configure the appropriate therapy settings specific to the patient:

a) **Compression Ventilation ratio**

– Press the **Mode** softkey and select the required ratio:  
QAS default **cont.**, (options 30:2 or 15:2)

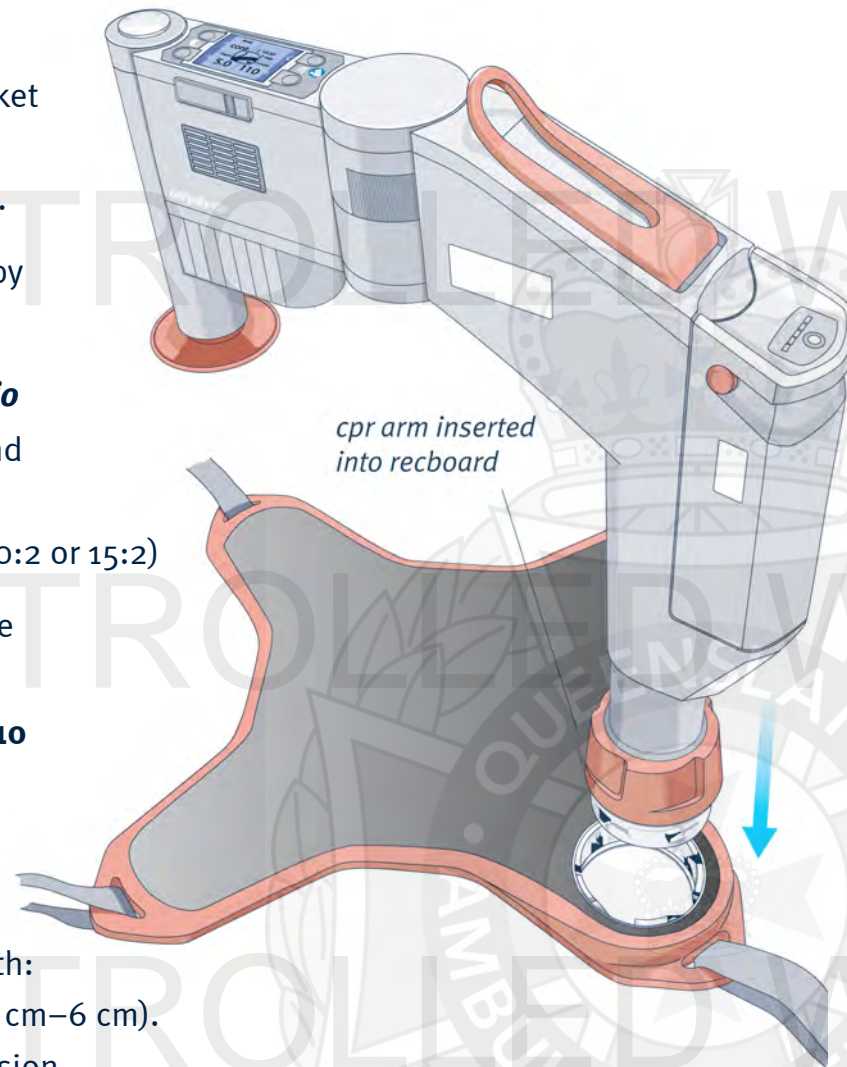
b) **Compression rate**

– Press the **Rate** softkey and select the required rate: QAS default **110**  
(options 80–120)

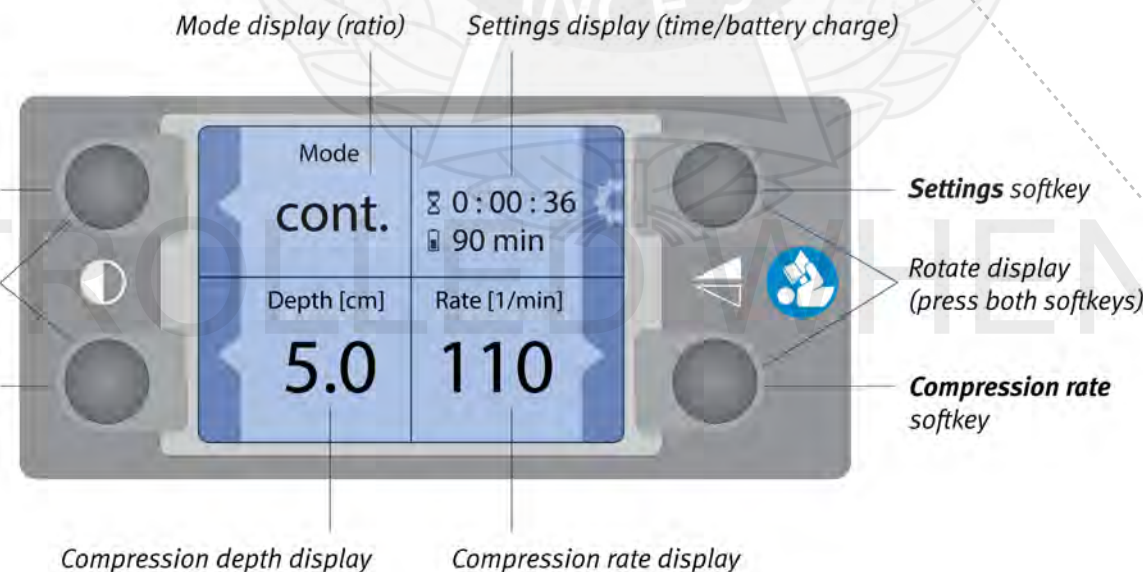
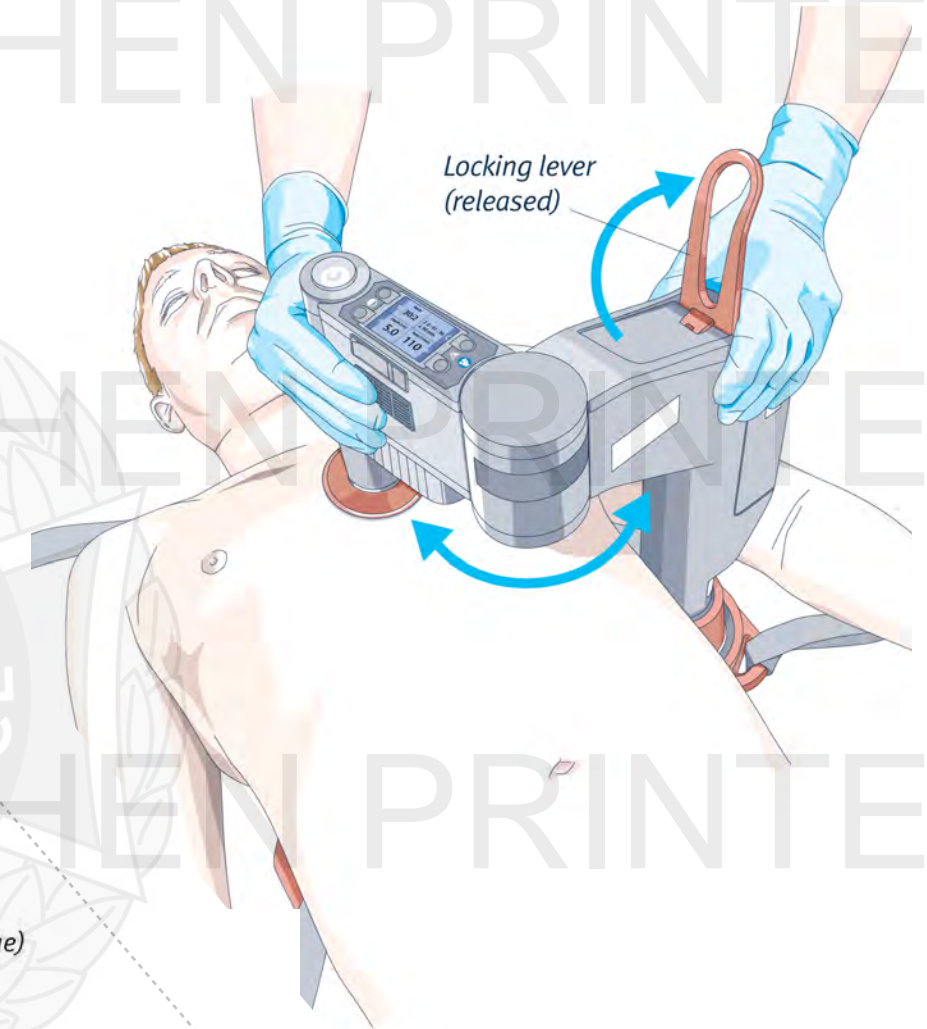
c) **Compression depth**

– Press the **Depth** softkey and select the required depth:  
QAS default **5 cm** (options 2 cm–6 cm).  
The recommended compression depth for adults is 5 cm or approximately 1/3 the chest height for paediatrics.<sup>[1]</sup>

Clinical judgement is required.

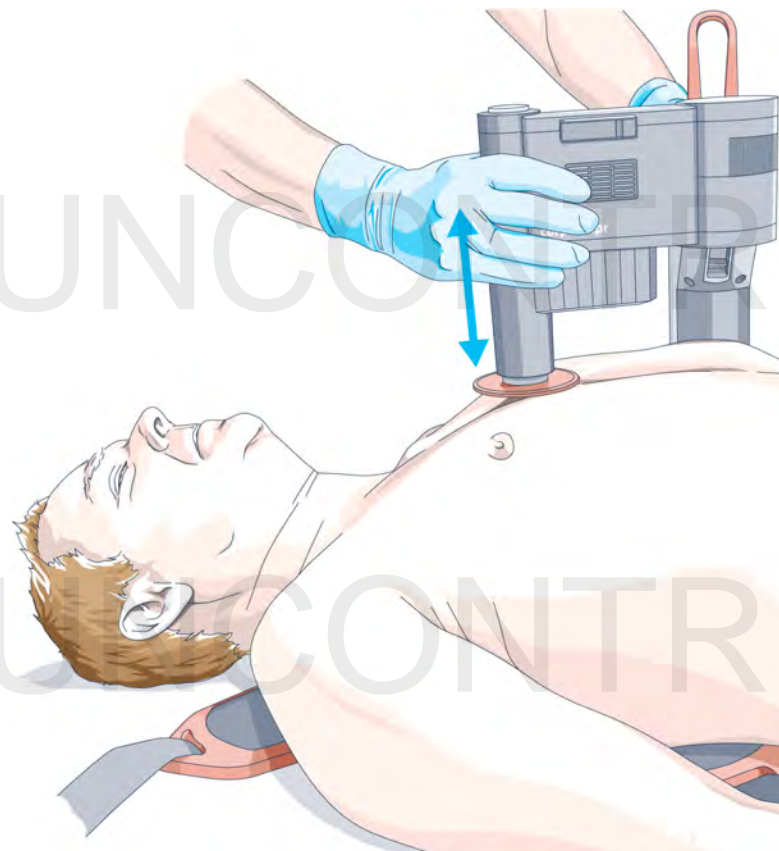


10. Release the red locking lever by pulling up.
11. Manoeuvre the cpr arm to position the stamp over the **middle** of the patient's sternum (therapy zone).

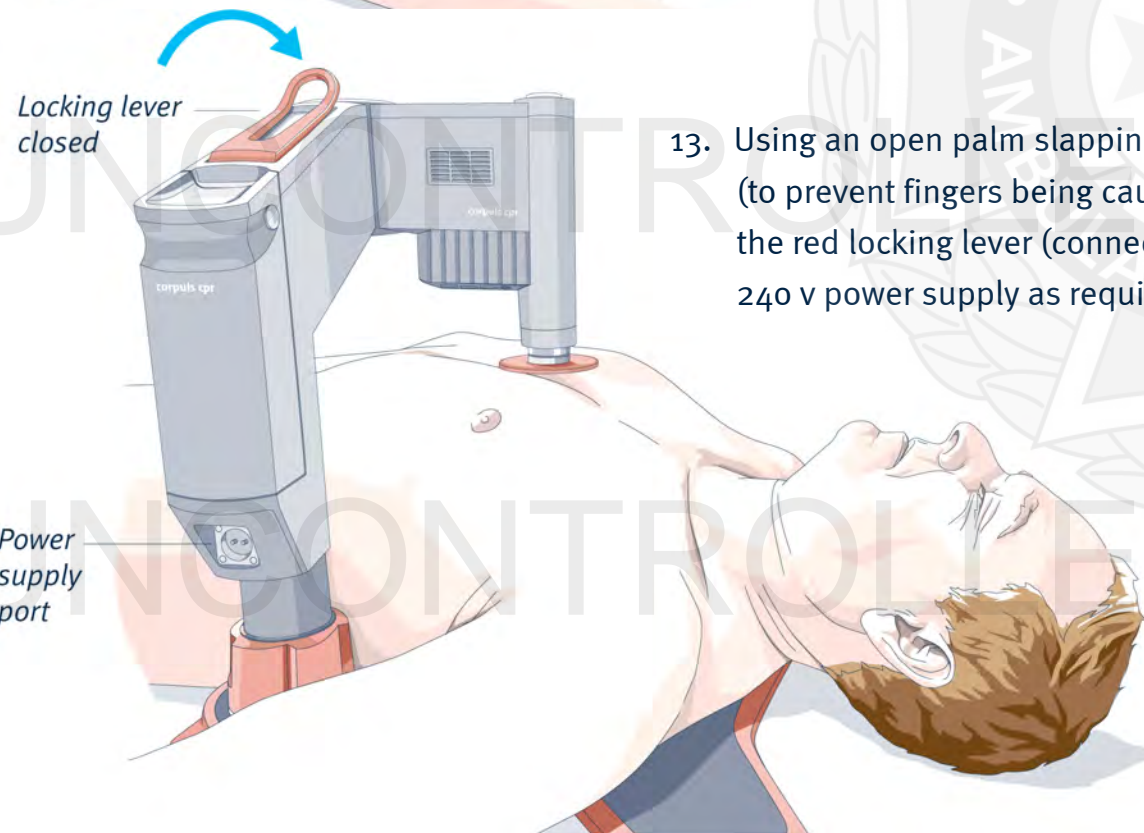




## Procedure – Mechanical chest compression device – corpuls cpr

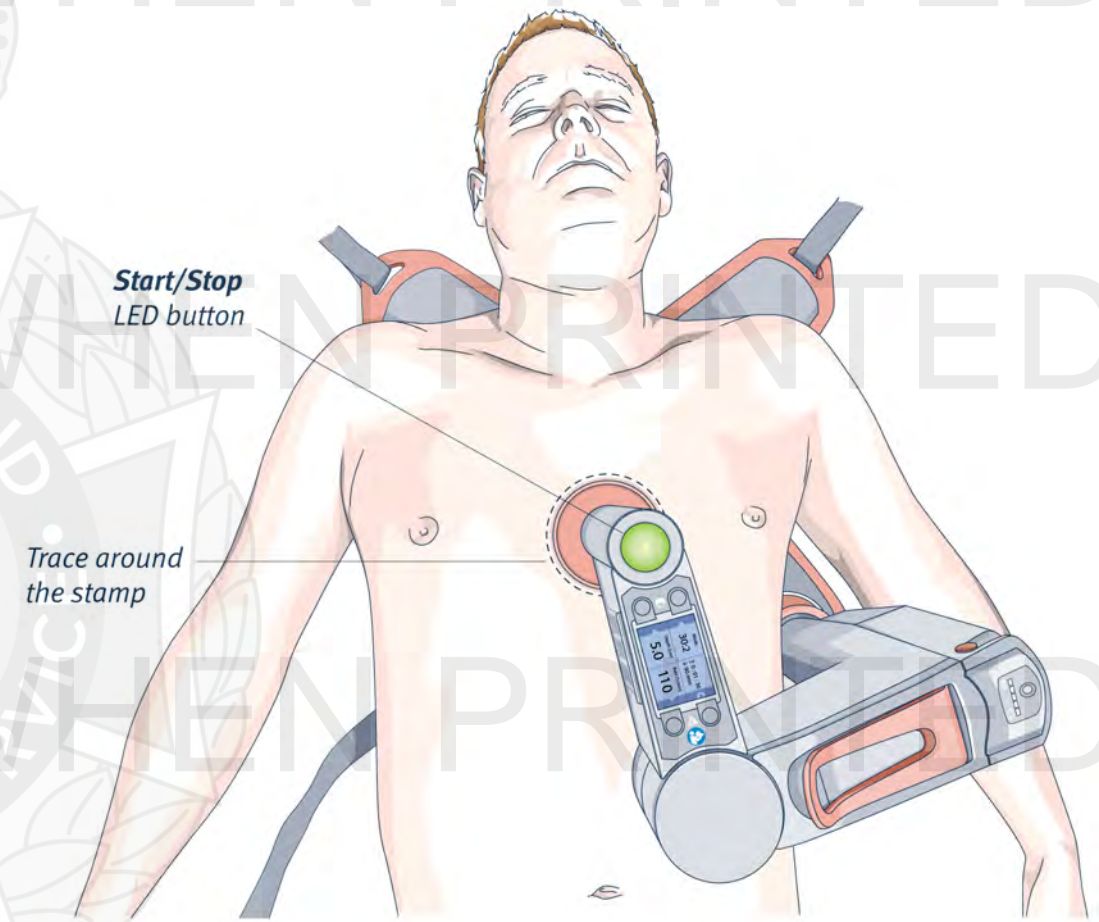


12. Adjust the height of the CPR arm by bringing the stamp into contact with the middle of the patient's sternum – the **Start/Stop LED** button will illuminate green when the optimal vertical position is achieved.



13. Using an open palm slapping motion, (to prevent fingers being caught) close the red locking lever (connect 12 v or 240 v power supply as required)

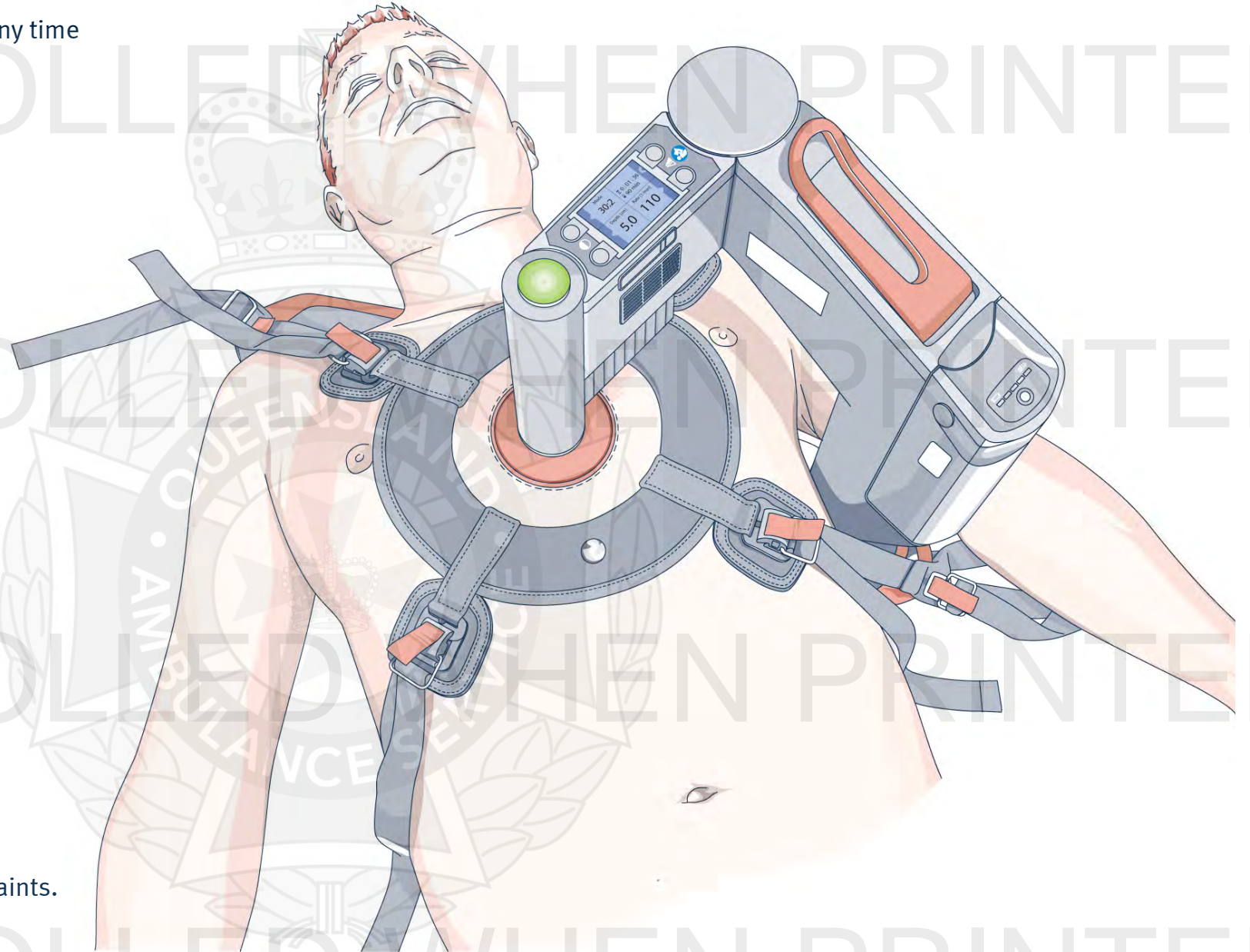
14. Press the green illuminated **Start/Stop LED** button to commence ECC – the corpuls cpr arm will gradually increase compression depth until full depth is reached at the 4th compression. If the cpr arm determines that the set depth requires an excessive force, the depth will be automatically limited.



15. When compressions are underway and the stamp is correctly positioned, quickly trace around the stamp with a soft surgical skin marker to provide a visual reference to enable monitoring of correct stamp position. This must be done on every patient. **To avoid undue injury to the patient, it is essential that the correct position of the stamp on the patient's chest is continually monitored and immediately repositioned if necessary.**

## Procedure – Mechanical chest compression device – corpuls cpr

16. Monitor the effectiveness of mechanical chest compressions. If necessary, adjustment of the rate, depth and ratio settings can be performed at any time without suspending operation of the mechanical arm by repeating step 9.
17. Mechanical compressions can be interrupted at any time by doing any of the following:
  - a) Pressing the **Start/Stop** LED button
  - b) Opening the red locking lever
  - c) Switching off the device
  - d) Removing the battery.
18. Prepare the patient for transport without undue delay:
  - a) Slide the Recboard ring under the stamp to the correct position on the patient's chest without stopping or interrupting mechanical compressions.
  - b) Fasten the Recboard ring to the Recboard using the magnetic clasps on the attached straps.
  - c) Using approved extrication aids, re-position the patient onto the ambulance stretcher.
  - d) Secure the Recboard to the ambulance stretcher and apply the patient stretcher restraints.





## Additional information

- For comprehensive instructions refer to the corpuls cpr User Manual.<sup>[2]</sup>
- Current literature does not suggest that CPR protocols involving MCCD are superior to conventional therapy involving manual chest compression alone.<sup>[2]</sup> However, these devices may enable effective ECC during transport, as a bridge to pPCI and/or Extracorporeal Membrane Oxygenation.
- **During placement of the corpuls cpr, interruptions to resuscitation (i.e. compressions and defibrillation) must be kept to an absolute minimum.**
- Defibrillation pads, wires or other potential obstructions must be kept clear of the stamp.
- DO NOT operate the corpuls cpr arm with the corPatch CPR sensor or ZOLL X Series<sup>®</sup> and X Series Advanced<sup>®</sup> CPR sensor.
- To reduce compression artefact, ECG analysis must be conducted by briefly suspending compressions.
- If a DCCS is indicated, briefly suspend mechanical compressions once the defibrillator is charged, deliver a DCCS and then immediately restart mechanical compressions. The stamp can remain in contact with the chest while defibrillating.
- The state of battery charge can be determined by pressing the battery LED gauge button.

Battery LED gauge button



- The estimated remaining operation time can be viewed on the display screen.

- The corpuls cpr battery is charged by connecting the 12 v or 240 v power supply cable to the power connection port.
- Following use, clean the corpuls cpr in accordance with the QAS Infection Control Framework. Inspect the stamp for signs of wear or damage and replace as necessary (estimated stamp lifespan is 60–100 uses).

### MCCD use on operational aircraft

MCCDs are a limited resource that must not be allocated to individual aviation assets and should only be loaded prior to attending a case with a high likelihood of requiring in-flight compressions.

An MCCD may only be taken on board an aircraft if specifically approved for carriage and use by the aircraft operator.

Examples of when a Flight Paramedic (FP) should consider loading an MCCD include:

- Attending a case likely to meet *CPP: Resuscitation/Mechanical Chest Compression Referral* requirements.
- Attending an IHT for an age-indicated patient with ongoing instability post-OHCA or failed thrombolysis.

When an MCCD is loaded onto an aircraft, the FP must ensure that:

- The MCCD is secured as per Stryker and aviation provider stretcher deck requirements.
- The pilot in command is notified **prior** to commencing in-flight MCCD use.