

# PR31: Mechanical CPR Devices

## Applicable To

- ACP and above

## Introduction

Mechanical CPR devices (e.g. LUCAS) are being used by select ACP, CCP, and Paramedic Specialist crews for medical cardiac arrests.

## Indications

Mechanical CPR devices may be used for **medical (e.g. non-traumatic)** cardiac arrests in the following circumstances:

- To ensure the safety of crews when conveying patients with CPR in progress in a moving motor vehicle or aircraft
- As part of an approved clinical trial (e.g. ECPR trial)
- In transfers with appropriately trained medical teams
- Search & rescue or retrieval/conveyance purposes
- If the device is already in place after being applied by an appropriately trained person (e.g., select first responders, Canadian Coast Guard, search and rescue, Canadian Armed Forces, etc.)
- The device may be left in place if the appropriately trained person is able to travel with the patient to hospital; if this is not possible, the device should be removed and manual CPR commenced for conveyance

## Contraindications

- **Mechanical CPR devices are NOT indicated for patients in traumatic cardiac arrest**
  - Patients in traumatic cardiac arrest should receive manual CPR in addition to other interventions as required for the patient's clinical situation; priority in these situations is expedited conveyance if the patient meets criteria for continuation
- Patient is too small: the suction cup is not being completely compressed when it is lowered
- Patient is too large: the support legs of the device cannot be locked into place without compressing the patient

## Procedure

### Assembly and Application of the LUCAS CPR Device:

1. Start manual compressions while another provider unpacks the LUCAS device. Press and hold 'ON/OFF' button on the user panel for one second. The device will perform a self-test.
2. Cease chest compressions to apply the back plate. As a team, lift the patient's upper body and lay the back plate below the armpits. If the upper portion of the device is not immediately available, resume compressions until the upper portion is ready.
3. Resume manual chest compressions (continue them through steps 4 and 5).
4. Place the upper portion of the LUCAS over the patient's chest so that the claw locks of the support legs can engage the back plate. Ensure that the patient's arms are outside the device.
5. Engage one support leg at a time starting with the closest one. **Confirm that both support legs are locked.**
6. Using two fingers, lower the suction cup until the pressure pad inside the cup touches the patient's chest. The lower end of the suction cup should be just above the xiphoid process.
7. Push 'PAUSE' (position 2) to lock the start position.
8. To start compressions, push 'ACTIVE' (30:2) (Position 3). Confirm that the device is working properly and check for central pulses upon compression.
9. To stop chest compressions, push 'PAUSE' (position 2).

**Attaching the Stabilization Strap:**

1. Lift the patient's head and place the support cushion under the patient's neck as close to the shoulders as possible.
2. Ensure that both device straps have been secured to the LUCAS support legs.
3. Tighten the buckles on the support cushion strap as required.
4. Ensure that the device remains properly positioned.

**Cleaning After Use:**

1. Clean all outer surfaces of the device, backboard, and neck strap with Accel disinfectant wipes. Be sure to clean the claw locks as well. Ensure a wet-contact time of 3 minutes.
2. Suction cup: unless grossly contaminated, continue with standard cleaning procedure above and put back in LUCAS bag for re-use.
3. Allow the device and accessories to dry before packing back into the bag.

**Notes**

Patients with traumatic cardiac arrest often have a cause of their arrest that does not respond to CPR (e.g., blood loss, tension pneumothorax, cardiac tamponade, etc.). Mechanical CPR devices take time to remove and can delay critical time-sensitive interventions on arrival to the emergency department (e.g., chest tube insertion, thoracotomy). This has been recently re-emphasized by trauma surgeons representing Trauma Services BC.

Priority for patients in traumatic out-of-hospital cardiac arrest is prompt conveyance to the nearest trauma centre if the patient meets criteria for continuation of resuscitation. Do not use mechanical CPR devices for these patients.

**Resources**

