Clinical Indications:
- Adult patient in cardiac arrest

Contraindications:
- Device does not fit patient (too small or too large)
- Patient <18 years of age
- Obviously Pregnant

Notes/Precautions:
- Minimize interruptions in chest compressions to place device.
- Must be appropriately trained

Procedure:

Placement
1. Continue manual CPR with ZOLL defibrillation pads and CPR puck
2. Position the bag with its top nearest to you. Remove from bag.
3. Push ON/OFF on the User Control Panel for 1 second to power up LUCAS in the bag and start the self test. The green LED adjacent to the ADJUST key illuminates when LUCAS is ready for use.
4. Remove the LUCAS Back Plate from the carrying bag.
5. Stop manual CPR.
6. Carefully put the LUCAS Back Plate under the patient, immediately below the arm pits. Use one of these procedures:
   a. Hold the patient’s shoulder and lift the patient’s upper body a small distance,
   b. Roll the patient from side to side.
7. Start manual CPR again.
8. Attach the support leg that is nearest to you to the Back Plate.
9. Stop manual CPR.
10. Attach the other support leg to the Back Plate, so that the two support legs lock against the Back Plate. Listen for click. *(Pull up once to make sure that the parts are correctly attached).*

Adjustment and operation
11. The compression point should be the at the same spot as for manual CPR (center of ZOLL CPR Puck) and according to guidelines. When the pressure pad in the Suction Cup is in the correct positing, the lower edge of the Suction Cup is immediately above the end of the sternum. *When using the Zoll X-Series monitor with feedback device (puck), the feedback device must remain in place on the patient’s chest under the LUCAS suction cup*
12. Use your finger to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum.
13. Adjust the height of the Suction Cup to set the Start Position.
   a. Make sure that LUCAS is in the ADJUST mode.
   b. Push the Suction Cup down with two fingers until the pressure pad touches the patient's chest without compressing the chest.
   c. Push PAUSE to lock the Start Position - then remove your fingers from the Suction Cup.
   d. Check for proper position. If not, push ADJUST, pull up the Suction Cup to readjust the central and/or height position for a new Start Position. Push PAUSE.
   e. Push ACTIVE (continuous) OR ACTIVE (30:2) to start the compressions.

14. **ALWAYS apply Stabilization Strap application.** The LUCAS Stabilization Strap helps secure the correct position during operation.

15. Once patient has a sustained ROSC, release and retract the “pressure pad” to allow for greater chest excursion and tidal volume during BVM usage.

**Ventilations**

16. LUCAS operates in two modes:

   **ACTIVE (continuous)** When you push this key LUCAS performs continuous compressions. The green LED signal will blink 8 times per minute to alert for ventilation during ongoing compressions.

   **ACTIVE (30:2)** When you push this key, LUCAS performs 30 chest compressions and then temporarily stops for 3 seconds. During the stop, the operator can perform 2 ventilations.
5 Use LUCAS™

5.1 Arrival at the patient

When you have confirmed a cardiac arrest, immediately start manual cardiopulmonary resuscitation (CPR). Continue with a minimum of interruptions.

5.2 Unpack LUCAS™

1. Position the bag with its top nearest to you.
2. Put your left hand on the black strap on the left side and pull the red handle so that the bag unfolds.

Note: LUCAS powers down automatically after 5 minutes if you let it stay in the ADJUST mode.

Caution - device alarm
If there is a malfunction, the red Alarm LED illuminates and a buzzer signal is heard. For trouble shooting, refer to section 8.3.

Caution - keep Battery installed
The Battery must always be installed for LUCAS to be able to operate, also when powered by the external Power Supply.
5.3 Assembly

1. Remove the LUCAS Back Plate from the Carrying Bag.

2. Stop manual CPR.

3. Make sure that you support the patient’s head.

4. Carefully put the LUCAS Back Plate under the patient, immediately below the arm pits. Use one of these procedures:
   a. Hold the patient’s shoulder and lift the patient’s upper body a small distance,
   b. Roll the patient from side to side.

5. Start manual CPR again.

6. Hold the handles on the support legs to remove the LUCAS Upper Part from the bag. Pull the release rings once to make sure that the claw locks are open.

7. Let go of the release rings.

**Note:** An accurate position of the Back Plate makes it easier and faster to position the Suction Cup correctly.
8. Attach the support leg that is nearest to you to the Back Plate.

5.4 Adjustment and operation

The compression point should be at the same spot as for manual CPR and according to guidelines.

When the pressure pad in the Suction Cup is in the correct position, the lower edge of the Suction Cup is immediately above the end of the sternum.

9. Stop manual CPR.
10. Attach the other support leg to the Back Plate, so that the two support legs lock against the Back Plate. Listen for click.
11. Pull up once to make sure that the parts are correctly attached.

WARNING - INCORRECT POSITION OVER CHEST
If the pressure pad is not in the correct position in relation to the sternum, there is an increased risk of damage to the rib cage and the internal organs. Also, the patient’s blood circulation is compromised.

Note: If the LUCAS Upper Part does not attach to the Back Plate, make sure that the claw locks are open and that you have released the release rings.

WARNING - TOO LARGE PATIENT
If the patient is too large, the Upper Part of LUCAS cannot lock to the Back Plate without compressing the patient’s chest. Continue the manual compressions.
Standards Procedure (Skill) Cardiac Section

CPR: Automated, LUCAS-2

1. Use your finger to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum.
   - If necessary, move the device by pulling the support legs to adjust the position.

2. Adjust the height of the Suction Cup to set the Start Position.
   a. Make sure that LUCAS is in the ADJUST mode.
   b. Push the Suction Cup down with two fingers until the pressure pad touches the patient’s chest without compressing the chest.

   c. Push PAUSE to lock the Start Position - then remove your fingers from the Suction Cup.

   d. Check for proper position. If not, push ADJUST, pull up the Suction Cup to readjust the central and/or height position for a new Start Position. Push PAUSE.

   e. Push ACTIVE (continuous) OR ACTIVE (30:2) to start the compressions.

WARNING - UNSATISFACTORY POSITION
Start manual CPR again if it is not possible to position LUCAS safely and correctly on the patient’s chest.

WARNING - TOO SMALL PATIENT
If you cannot enter the PAUSE mode or ACTIVE mode when the pressure pad touches the patient’s chest and LUCAS alarms with 3 fast signals. Start manual compressions again.

This procedure has been altered from the original NCCP Procedure by Durham County EMS Medical Director.

revised 3/2019
WARNING - INCORRECT START POSITION
The patient’s blood circulation is compromised if the pressure pad presses down too heavily or too lightly on the chest. Push the ADJUST key and adjust the height of the Suction Cup immediately.

Caution - do not block the vent holes
Do not cause a blockage of the vent holes under the hood since this can cause the device to become too hot.

5.5 Apply the LUCAS™ Stabilization Strap
The LUCAS Stabilization Strap helps secure the correct position during operation. Apply it while LUCAS is active to keep interruptions to a minimum.

Caution - Stabilization Strap application
Delay the application of the LUCAS Stabilization Strap if this prevents or delays any medical treatment of the patient.

1. Remove the cushion strap, which is a part of the Stabilization Strap, from the Carrying Bag (the support legs strap of the Stabilization Strap should already be attached to the support legs).
2. Extend the cushion strap fully at the buckles.
3. Carefully lift the patient's head and put the cushion behind the patient's neck. Position the cushion as near the patient's shoulders as possible.
4. Connect the buckles on the support leg straps with the buckles on the cushion strap. Make sure that the straps are not twisted.
5. Hold the LUCAS support legs stable and tighten the cushion strap tightly.

Caution - gel on chest
If there is gel on the patient's chest (e.g. from ultrasound examination), the position of the Suction Cup can change during operation. Remove all gel before you apply the Suction Cup.

Caution - keep your fingers away
Do not put your hands or other body parts on or below the Suction Cup when LUCAS operates. Do not touch the claw locks, especially when you lift the patient.

WARNING - PATIENT INJURY
Do not let the patient or the device stay unattended when LUCAS operates.

WARNING - CHANGED POSITION DURING OPERATION
If the position of the Suction Cup changes during operation or during defibrillation, immediately push ADJUST and adjust the position. Always use the LUCAS Stabilization Strap to help secure the correct position.

WARNING - MALFUNCTION
If there are interruptions, or the compressions are not sufficient, or something unusual occurs during operation: Push ON/OFF for 1 second to stop LUCAS and remove the device. Start manual chest compressions.

WARNING - LOW BATTERY
When the orange Battery LED shows an intermittent light, do one of these:

- Replace the Battery with one that is charged.
- Connect the external LUCAS Power Supply.
6. Make sure that the position of the Suction Cup is correct on the patient’s chest.

   If it is not, adjust the position:
   a. Push **ADJUST**.
   b. Release the cushion straps from the support leg straps.
   c. Adjust the Suction Cup position (as described in the section 5.4.2).
   d. When the Suction Cup is in the correct position, push **ACTIVE (continuous)** or **ACTIVE (30:2)** to start the compressions again.
   e. Attach the cushion strap again. Refer to the steps 2 to 5 above.

5.6 Prepare to lift the patient

1. Make a decision about what equipment you will move and where to put the transportation device.
2. Those at the patient’s side:
   a. put one hand below the claw locks under the support leg
   b. with the other hand, hold the patient’s belt, trousers or under the thigh
3. Make sure that the patient’s head is stable.

5.6.2 Move the patient

5.6.1 Secure the patient’s arms

When you move the patient, you can secure the patient’s arms with the Patient Straps on the LUCAS. This makes it easier to move the patient.

**Caution - do not lift by the Patient Straps**
Do not use the Patient Straps to lift the patient. The straps are only to attach the patient’s arms to LUCAS.

**Caution - IV access**
Make sure that IV access is not obstructed.

5.6.3 Lift the patient

1. Push **PAUSE** to temporarily stop the compressions.
2. Lift and move the patient to a stretcher or other transportation device (backboard, vacuum mattress or similar).
3. Make sure that the Suction Cup is in the correct position on the patient’s chest.
4. Push **ACTIVE (continuous)** or **ACTIVE (30:2)** to start the compressions again.