

Lifepak 20 quick guide to neonatal/paediatric synchronised cardioversion (for staff already trained in cardioversion)

1. NB Ensure appropriate sedation/anaesthesia and airway management
2. Unplug the grey end of the defibrillator lead from the black test plug
 - The defibrillator lead is front right and is the thicker of the two leads
3. Turn on the defibrillator by pressing button 1, marked “**ON**”
4. Push the grey tab marked “**MANUAL**” to the right and pull open the door
5. Using button 2, marked “**ENERGY SELECT**” adjust the energy
 - First shock: 0.5 - 1 joule per Kg
 - Second and subsequent shocks: 2 joules per Kg
 - Press the down arrow part of the button to reduce the energy
 - If necessary round up to the next energy level and note that the lowest available is 2j
6. Apply defibrillator pads to the patient and plug the connector into the grey end of the defibrillator lead
 - Child sized pads should be used for neonates (and children up to 15 Kg)
 - Adult sized pads for adults and children over 15 Kg
7. Turn on synchronisation by pressing the button marked “**SYNC**”
 - NB After a synchronised shock is delivered the SYNC function turns off so you must press SYNC prior to each synchronised shock
8. Visually confirm synchronisation
 - A blinking green light on the actual SYNC button (this blinks each time a QRS complex is detected)
 - Triangular “sense markers” ▼ appear above QRS complexes
 - If there are no triangles skip to 11 below
9. Warn staff to remove any free flowing oxygen and stand clear, then charge the defibrillator using button 3, marked “**CHARGE**”
 - Once charged a continuous two tone alarm sounds
10. Ensure everyone is clear of the patient, bed, etc and oxygen has been removed and then push **AND HOLD** 
11. If the defibrillator cannot synchronise it will not deliver the shock
 - If charged, press the speed dial to disarm the defibrillator!
 - Attach the 3 lead cable and note that the current lead is displayed in the top left of the screen
 - Change lead by pressing the button marked “**LEAD**” (pressing again will jump to the next lead)
 - Choose the lead with the biggest QRS complexes then go back to 8.

Disarming the defibrillator:

“Press speed dial to disarm” is displayed whenever the defibrillator is charged. The speed dial is the round button, middle bottom, below the label “Speed Dial”.

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Notes about cardioversion and use of the 3 Lead cable

When attempting synchronised cardioversion the Lifepak 20 will sense through the default lead or the lead set by the user.

The default lead is called “Paddles” (for historical reasons) and actually refers to the therapy pads as opposed to the 3 lead ECG cable (which can display Leads I, II or III). So, in total, available views are Paddles, Lead I, II, III and a combined Paddles and Lead II.

To both sense and deliver synchronised shocks with therapy pads, Physio Control recommend that the therapy pads are placed anterior-laterally. In this position the therapy pads show a view that is, essentially, the same as Lead II. Lead II typically shows the biggest QRS complexes thus making it more likely that the defibrillator will be able to detect them and synchronise. This is all well and good on an adult or large child.

However, to avoid a “short circuit” there should be at least a 2.5cm gap between therapy pads and this will usually preclude anterior-lateral placement on a neonate or infant (as the pads could touch or even overlap). In this case therapy pads should be placed anterior-posterior. The disadvantage of anterior-posterior pad placement is that the QRS complexes may not be as easy for the defibrillator to sense and this may hinder or prevent synchronisation. In this case a solution is to add the 3 Lead and switch to (typically) Lead II.

In short, putting the 3 Lead on and actively changing Leads to find the best view may be of immense benefit. In contrast, routinely putting the 3 Lead on without actually changing Leads to look at Lead I, II or III serves no purpose.

Energy levels in Paediatrics

The European Resuscitation Council and the Resuscitation Council (UK) guidelines as per the European Paediatric Life Support manual, Third Edition (2011), suggest an initial shock at 0.5-1 joule per Kg and up to 2 joules per Kg if this does not work.

The Advanced Life Support Group guidelines as per the Advanced Paediatric Life Support manual, Fifth Edition (2011), suggests an initial shock at 1 joule per Kg and 2 joules per Kg if this does not work.

The practical limitations with the Lifepak 20 are that the minimum energy level is 2 joules, with 1 joule increments up to 10 joules, and larger increments thereafter. So it is unlikely that an absolute energy level of 0.5 joules per Kg will be achievable. Rather, it would seem sensible to set the first energy level to a number that falls in the range of 0.5-1 joule per Kg. And for neonates less than 2 Kg even this 0.5-1 joule per Kg will not be possible. Therefore it remains a clinical decision based on the condition of the neonate in balance with other treatment options.