



CLINICAL PRACTICE GUIDELINE

Guideline coverage includes NICU KEMH, NICU PCH and NETS WA

Cardioversion and Defibrillation

This document should be read in conjunction with the [Disclaimer](#)

For arrhythmia algorithms and cardiac arrest on NICU algorithm see [Arrhythmia and Cardiac Arrest on NICU: Treatment Algorithms](#).

Please note: Medical Staff **only** are able to deliver a shock via defibrillator in the NICU.

DC cardioversion and defibrillation are used for rapid termination of a tachyarrhythmia which is either unresponsive to medical treatment or where the patient has cardiovascular compromise.

Baseline medical treatment consists of: correction of metabolic abnormalities, vagal manoeuvres (ice to face/ deep suctioning) and use of medications (eg. adenosine, digoxin, amiodarone, lignocaine). It is best to try these manoeuvres if vascular access is rapidly available and patient is stable enough.

Defibrillators are capable of delivering 2 modes of shock, synchronised and unsynchronised:

- **Synchronised** shocks are of **lower dose (0.5-2 J/kg)** and used for **cardioversion**.
- **Unsynchronised** shocks are of **higher dose (4 J/kg)** and used for **defibrillation**.

1. Cardioversion (synchronised):

- i. **Urgent** – Used in unstable patients with a tachyarrhythmia who have a perfusing rhythm but with signs of cardiovascular compromise e.g.
 - Supraventricular tachycardia (SVT) with poor perfusion or no access and shock.
 - Ventricular tachycardia (VT) with pulse but poor perfusion.
 - Atrial flutter with shock.
 - Atrial fibrillation (AF) with shock (rare in neonate).
- ii. **Elective** – Used in patients with stable SVT/ VT/ atrial flutter/ AF unresponsive to other treatments.

NB *If unsynchronised shock used in these circumstances, could convert into an unrecoverable rhythm.*

2. Defibrillation (unsynchronised):

Used in pulseless arrest with a shockable rhythm: (pulseless VT or ventricular fibrillation (VF)).

NB Asystole is NOT a shockable rhythm.

Preparation for Cardioversion/ Defibrillation

If in pulseless arrest, then without delay commence CPR and follow the Cardiac arrest in NICU algorithm' from below link.

['Arrhythmia and Cardiac Arrest on NICU: Treatment Algorithms'](#)

Patients with a perfusing rhythm (pulse present):

- **Personnel to be present:**
 - If defibrillation is being contemplated, and not present then call NICU consultant and cardiologist immediately.
 - If in PCH 3B NICU and patient in pulseless arrest, or using defibrillator urgently out of hours with no NICU consultant on site then call hospital code blue '55'.

See Who to call in the event of an arrhythmia or cardiac arrest on NICU' Algorithm in ['Arrhythmia and Cardiac Arrest on NICU: Treatment Algorithms'](#)

- **Patient preparation:**
 - Ensure good vascular access – preferably cannula in antecubital fossa or short CVC (femoral or IJ). Consider IO if difficult access. Note, PICC <3F not suitable as takes too long to inject bolus medication/ flush.
 - If time and patient status allows, patient should be intubated/ ventilated and sedated appropriately.
 - Ensure adequate FiO₂ (100% for most near-term and term neonates).
 - If no intra-arterial BP monitoring, then cycle BP cuff every 2 mins.
 - Try to get 12-lead ECG or at least a rhythm strip printed.
 - Confirm rhythm with cardiology.
 - Review blood gas/ electrolytes and correct any abnormalities as able.
 - **Use relevant arrhythmia algorithm.** See ['Arrhythmia and Cardiac Arrest on NICU: Treatment Algorithms'](#)

Defibrillation/ Cardioversion using Philips Heart Start MRx Defibrillator

1. Bring defibrillator to bedside. (As long as has been charging, does not need to be plugged into mains)
2. Apply HeartStart infant defib pads to patient:
 - Pad labelled FRONT in middle of chest anteriorly (see illustration on pack).
 - Pad labelled BACK in middle of upper back posteriorly (see illustration on pack).

NB Make sure that the pads do not touch and there is no gel on chest.
3. Plug defib pad leads into therapy cable.
4. Turn therapy knob to 'MONITOR' – the pads will now read the ECG trace.
5. For SVT/ VT with pulse: press 'SYNC' button. The monitor should now capture each R wave.
6. For VF/ pulseless VT/ polymorphic VT or VT which won't capture on 'SYNC', then make sure 'SYNC' is OFF.
7. Dial up therapy knob to required Joules:
 - a. 1J/kg and subsequently 2J/kg for SVT/ VT
 - b. 4J/kg for pulseless arrest with VF/ pulseless VT

If using 1-10J, then use navigation arrows below screen to set desired dose. Round UP to nearest joule.

8. Press 'CHARGE'.
9. Announce '*stand clear*'.
10. Make sure everyone clear of patient/ leads.
11. Press 'SHOCK' button until discharged (make take some time on 'SYNC' mode).
12. Printer will automatically print from a few seconds before shock until stopped by pressing 'PRINT' button.
13. Repeat as necessary and according to arrhythmia/ cardiac arrest algorithms.

Related WNHS policies, procedures and guidelines

Neonatal Clinical Guideline – [Arrhythmias and Cardiac Arrest on NICU: Treatment Algorithms](#)
[Recognising and Responding to Clinical Deterioration](#)

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