

Guideline

Use of the Tecotherm for active cooling during neonatal transfer

1 Scope

For use within the Paediatric and Neonatal Decision Support and Retrieval Service (PaNDR) for the East of England.

2 Purpose

To ensure the safe and proper use of the Tecotherm for active cooling during transfer.

3 Definitions and abbreviations

ANNP Advanced Neonatal Nurse Practitioner
CPAP Continuous Positive Airway Pressure

4 Undertaken by

The guideline is to be used by members of the PaNDR team – qualified nurses, ANNPs and doctors who have successfully completed their Tecotherm competency.

5 Clinical equipment list

- Tecotherm and connective foam hose
- One litre bottle of sterile water and appropriate filling up bottle. There are two types of filling up bottle, vented and non-vented. It is important to check you have the correct bottle. Tecotherms made before 2015 must use the vented bottle and Tecotherms made after 2015 must use the non-vented bottle.



Vented Bottle



Non Vented Bottle

- If you use the wrong bottle with the wrong Tecotherm you are likely to fill the fluid reservoir inside the Tecotherm with air instead of water. Subsequently the Tecotherm will keep alarming low fluid as there is not enough fluid circulating in the Tecotherm and mattress, this could consequently result in the baby not being cooled/warmed effectively.
- Cooling mattress and cover (e.g. thin sheet or muslin).
- Inspiration rectal probe, steri-strips and tegoderm to secure. Only inspiration probes should be used with the Tecotherm. Other probes may fit the port on the Tecotherm but the reading will not be reliable.
- Skin probe and reflective sticker to attach probe.

6 Turning the Tecotherm on

When the power button is pressed, the machine will undertake a series of self-tests, during which alarms will be displayed. When these are completed, press 'yes' to confirm.

7 Setting up the Tecotherm on arrival to the infant

- The mattress is stored in the cooling pouch in the ambulance. Check that the mattress is pre-filled with water- visual inspection/ feel for 'plumpness'. If under-filled the Tecotherm will alarm continuously and will fail to cool efficiently. Brand new mattresses are filled as per manufacturer's instructions. The mattresses are reusable.
- Connect one end of the white foam hose into the bottom 2 ports of the Tecotherm and the other end of the hose into the 2 ports on the mattress as seen in the photo below.



- Fill the correct filling up bottle with sterile water. Connect the bottle to the upper ports of the tecotherm. The pictures below indicate the correct ports for the vented and non-vented bottles.



- Turn the Tecotherm on and select '**constant mattress temperature mode**'
- Lay the mattress on a flat surface, invert the filling up bottle and wait until the water level inside the bottle stops falling and stops bubbling and then disconnect the bottle.
- Leave the Tecotherm in constant mattress temperature mode until ready to use.
- If you cannot get any more water into Tecotherm/mattress but the Tecotherm keeps alarming low flow volume, it may be that the Tecotherm fluid reservoir has filled with air. This air needs to be replaced with water to increase the circulating volume of water to the correct level. You will need two people to do this. Attach the correct filling bottle and one person can hold the bottle up. The other person needs to release the Tecotherm from the incubator trolley clamp, pull the Tecotherm forward a little bit (you do not want to accidentally unplug it from the mains) then lift the Tecotherm up at the front so the feet come off the floor. You may then see air bubbles going into the filling bottle, subsequently releasing the air from the Tecotherm fluid reservoir.

8 Applying the temperature probes

Apply the Tecotherm skin temperature probe securely in the infant's right axilla. Apply water soluble gel to the rectal probe tip. Insert the rectal probe tip 2-3cm into the infant's anus and secure to the infant's thigh with steri-strips and tegaderm if required.

Plug the probes into the Tecotherm sockets marked 'R' for rectal and 'S' for skin.

9 Starting active cooling

- Once the infant has a rectal and skin probe in place, cover the cooling mattress with a thin sheet or muslin. Place the mattress underneath the infant.
- Select '**Options**' on the Tecotherm screen and then select '**End treatment and save data**'. This will then revert to the main menu. Select '**Servo control mode (constant rectal temperature)**'.
- The Tecotherm is pre-set to maintain a rectal temperature of 33.5°C. (Keep to this setting).
- The Tecotherm will initially show the set, rectal, skin and mattress temperatures. After 60 seconds this will change to display the current rectal temperature in a large coloured number. If the rectal temperature is within 0.5°C of target temperature this will be **green**, if it deviates more than 0.5°C from the set point it will appear **red**. The set, rectal, skin and mattress temperature can be viewed by pressing the 'details' button at any time.
- When the temperature deviates below 29°C or above 39°C, the Tecotherm will alarm and default to '**fall back mode**' – this will ask what temperature you want the mattress to stay at whilst you trouble-shoot (e.g. check probe positions and make sure mattress hose is not kinked). Once the temperature comes back into range the machine will continue in servo mode.
- If the fluid level in the machine becomes too low, a prompt will appear on the screen. To top up, attach the filling bottle again to the port and invert upside down as before.

10 Moving across to the transport incubator

- If the infant is on respiratory support (ventilated, CPAP or high flow) turn the transport incubator off. If the baby is on no respiratory support, or low flow, set the incubator to its lowest heat setting to ensure air flow through the incubator. Ensure that the connecting hose is threaded underneath the incubator so that it cannot get caught during transfer and that it is not kinked or trapped.
- Once the infant is ready to move to the transport incubator, transfer across on the cooling mattress. Grey ties or gauze can be used to tie the mattress across the infant (see photo below).



11 Moving the Tecotherm from the mains supply to the ambulance

- The Tecotherm does not have a battery therefore will not work if unplugged. If the mains power is turned off before the Tecotherm is powered down it will emit a constant high pitched alarm which cannot be silenced until mains power is restored.
- To move the Tecotherm from the mains supply to the ambulance supply, select '**options**' and scroll down to '**end treatment and save data**' then return to main menu and scroll down and select '**power off**'. Once in the ambulance, plug back in and restart the tecotherm.

12 Power failure

In the event of a power failure, the system will shut down. Settings and patient data will be retained. The power lead from the back of the tecotherm can be plugged directly into the mains supply on a unit or in the ambulance.

13 Cleaning the Tecotherm

The Tecotherm, hose and probes should be wiped with Tristel or clinell wipes and dried thoroughly after use. The mattress should be cleaned with clinell wipes dried thoroughly and stored rolled to prevent cracking.

The Tecotherm requires deep cleaning every 2 months with Tristel solution (dilute one sachet of Tristel in 5 litres of water). This should be carried out by the PaNDR clinical team that are competent to use it. To do this the Tecotherm should be removed from the trolley, ensure the ventilation slits are clear and free from dust. Instructions for deep cleaning can be found in the clinical room or the following video from Inspiration Healthcare.

<https://www.youtube.com/watch?v=M8rqk2Kx89Q>

14 Monitoring compliance with and the effectiveness of this document

Audit standards:

The PaNDR team will monitor compliance with this document by undertaking regular audits which will be reported back to the consultants and lead nurse.

The effectiveness of the document will be monitored by review of any reported incidents by the lead consultant and nurse for risk

Equality and diversity statement

This document complies with the Cambridge University Hospitals NHS Foundation Trust service equality and diversity statement.

Disclaimer

It is the responsibility of all staff to ensure they are using the latest version of a document.

Document management

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