Neuroprotection: a guide to the latest equipment

Sustained trauma during delivery can result in brain injury due to lack of oxygen to the brain and cause hypoxic-ischaemic encephalopathy (HIE) in infants. There is a need for neuro-protective strategies and therapies to be developed to support the developing brain and prevent disability. In the case of neuronal injury, neuroprotective interventions are intended to help the brain reduce neuronal cell death. Various equipment can be used to monitor the condition and to provide treatment options. We examine the latest equipment.

NOAH tissue oximetry system, coming soon from OxyPrem, is a neonatal specific near-infrared spectroscopy monitoring system that uses a high precision reusable sensor to provide real-time, continuous tissue oximetry. The self-calibrating, non-adhesive sensor is gently placed on the patient. To keep it in place, it can be positioned underneath the CPAP cap or be attached with a bandage.

Using 10+ wavelengths of light and a dynamic calibration approach, advanced technology maximises robust signal processing while minimising surface signal contamination to ensure reliable and accurate continuous monitoring. NOAH uses liquid phantom validation, a progressive benchmark approach that was recently included within the international safety and performance standards for cerebral oximetry monitors. This approach enables reproducible validation over a broad range of oxygenation and haemodynamic states of neonatal physiology.

A new version of the **nëo** cerebral function monitor for neonates is available from Central Medical Supplies (CMS). The monitor is now available with **Viewlite** software, which enables healthcare professionals to review data remotely. Improvements to functionality also allow users to export aEEG data from the nëo monitor and review it on any PC. Viewlite software integrates with the simple and easy-to-use workflows of the monitor solution. Compatible with Windows operating systems, Viewlite allows healthcare professionals to scroll through trace data as if they were at the nëo monitor and add annotations remotely. Viewlite software is designed for viewing offline, where both aEEG and EEG recordings can be exported from the nëo monitor. Four annotation icons can be customised and added: event marker, seizure event, artefact event and the epoch event.

The **Tecotherm NEO** infant cooling system by International Biomedical is small and lightweight and offers total body cooling and warming for the NICU or mobile therapeutic hypothermia. The Tecotherm Neo system is designed to treat HIE and the device can minimise the long-term effects of brain injury and improve recovery in babies born with HIE. It also provides supplemental heat for additional thermo-regulation support. The three operational modes available are servo-control complete treatment, servo-control constant temperature and constant mattress temperature. Data can then be exported via USB stick.

The **Olympic Brainz Monitor** by Natus is simple, automated and secure. It provides actionable neurological information during the early stages of newborn development. Through seamless monitoring and automated seizure detection, encrypted data is provided to help staff make clinical decisions. The monitor alerts the user when a possible seizure has been detected and alerts to changes in the background pattern. CFMsight provides enhanced signal display for easier trace interpretation and Windows 10 gives faster and enhanced security features. The large touchscreen monitor is designed to enhance workflow.

Belmont Medical Technology's **CritiCool** gives the clinician control over patient thermal regulation. CritiCool functions as a control unit that constantly provides feedback of the patient's core and surface temperature via connected sensors. Using these measurements, CritiCool's proprietary algorithm maintains the desired temperature throughout treatment by bringing the water to the target temperature and circulating it in a closed-loop system. The patient's core temperature is read every 133 milliseconds to allow for automatic adjustments in order to maintain the physician-determined pre-set temperature.

The control unit pairs with the **CureWrap** single use garment to envelop the patient for advanced patient temperature management. Operating CritiCool is simple: Clinicians set the desired temperature on the device, wrap the appropriately

sized CureWrap garment around the patient, connect the hoses to the wrap and the device, then initiate thermal regulation with a touch of a button. A single-use, body-shaped, flexible garment, CureWrap is easy to wrap and secure to the patient. A pressure relief algorithm periodically lets the water drain from the wrap, for slight repositioning of the patient, and specially designed channels within the garment distribute pressure.

Infant Supplier Guide provides a searchable database of equipment for the care of sick and premature infants: www.infantjournal.co.uk/supplierguide.html