MiraCradle® - Neonate Cooler is an affordable cooling device which uses the advanced save® Phase Change Material (PCM) technology to induce therapeutic hypothermia among newborns suffering from birth asphyxia. It has been developed by Pluss® in collaboration with CMC, Vellore. It is easy to use, safe, light weight, portable and gives the precise temperature control of 33-34°C for a period of 72 hours with minimal manual supervision and no requirement of constant electricity supply.

Established in 1994, Pluss Advanced Technologies Pvt. Ltd., is a materials research and manufacturing company involved in the field of speciality polymeric additives and Phase Change Materials. Research and innovation has been the focus of the company since inception. The company pioneers in creating cost effective and innovative products and applications that provide impacting solutions.

Experience, interdisciplinary thinking and practical skills form the growth guidelines for PLUSS®. The company has an equity infusion from Tata Capital Innovations Fund.

The MiraCradle® Advantage

**SAFE**
Electricity free cooling system does not have any electrical supply near the baby

**EFFICIENT**
Gives precise temperature control

**EASY TO USE**
Minimal manual supervision required. PCMs can be charged in a normal refrigerator

**ECONOMICAL**
Less than 1/5th of the cost of the available electronic devices

**LONG LASTING**
The PCMs are designed for repetitive use
The MiraCradle® - Neonate Cooler

Conduction Mattress
save® FS21
save® FS29
Cradle

“every infant has a right to live”
Components of MiraCradle® - Neonate Cooler

**Insulated Cradle**
It is a rotomoulded plastics structure which serves as a framework for placing all the other components of MiraCradle® - Neonate Cooler and also provides insulation to the PCM helping it last for longer hours.

**savE® FS29**
This forms the bottom layer of the MiraCradle® - Neonate Cooler. Three units of savE® FS29 PCM are placed at the bottom of Cradle, savE® FS29 in solid state passively extracts heat from the neonate’s body which is at 37°C thereby inducing and sustaining hypothermia.

**savE® FS21**
This is the middle layer of the device. savE® FS21 is used in conjunction with savE® FS29 to quickly bring the temperature of the neonate down to 33°C. It is subsequently removed and savE® FS29 takes over to sustain the temperature for longer hours.

**Conduction Mattress**
The conduction mattress is a gel bed which provides a smooth surface for the baby to lie on and improves heat transfer between the baby and the PCM.
Clinical Evidence

   Randomized Controlled Trial. 50 infants in India. Conventional MRI was available for 46 infants and demonstrated significantly less moderate/ severe abnormalities in the cooled (n=2, 9%) than in the non-cooled (n=10, 43%) infants. Q

   103 babies at 10 different hospitals in India. The mean (SD) deviation of temperature during cooling phase was 33.5 ±0.39°C.

   50 babies at Bapuji Child Health Institute, KA. Concludes MiraCradle is an effective device in reducing asphyxia induced morbidity in low-resource settings.

   41 babies at CMC. The mean (±SD) temperature during cooling phase was 33.45 ±0.26°C.
Recognition

- World Health Organization: Included in WHO Compendium of Innovative Health Technologies for low resource settings
- Confederation of Indian Industry: Twice winner under the Most Innovative Company Manufacturing sector Micro and Small Enterprise category
- DST-Lockheed Martin India Innovation Growth Programme 2015 (4th out of top 50 innovations)
- Christian Medical College, Vellore: Developed in collaboration with
- NRDC Award for Meritorious Invention - 2014: Designed under NID’s Design Clinic Scheme for MSME’s
- MIT Innovators under 35 Award - 2016, 2017: Winner of Healthcare Excellence Award - 2014
- Technology Development Board: Successfully commercializing an indigenous technology
- Winner of India Innovates 2020 Award in the Healthcare Category
- Winner under the Innovative Medical Equipment category
- Winner of Plasticon Award 2015

Patents

- US - 10,258,500B2
- Nigeria - NG/PT/C/2015/1537
- Europe - EP3100457
- South Africa - WO 2014/203274 A3
- AR IPO - AP/P/2015/008765
- Malaysia - MY-174551-A

FER Issued

- India - 1796/DEL/2013
- Brazil - BR 11 2015 024821 7
MiraCradle® - Neonate Cooler will be a good investment for the Neonatologists and Pediatricians dealing with cases of perinatal asphyxia. It is easy to use and affordable in a resource limited setting. It goes without saying that the cooling procedure should be undertaken with close monitoring of the baby. MiraCradle® - Neonate Cooler is easy to use and the maintenance cost is almost nil.

Dr. B. Vishnu Bhat (Professor and Head, Department of Pediatrics, Division of Neonatology, JIPMER)

In India, asphyxia results in approximately quarter of the neonatal deaths and is a huge burden on neonatal morbidity and neurodevelopmental sequelae. Hypothermia is the only proven intervention to improve the neurodevelopmental outcomes; but because of the high cost of the currently available machines it is not available to most babies in the developing world. MiraCradle® - Neonate Cooler is a significant low cost innovation to help such babies in this part of the world.

Dr. Sanjay Wazir Consultant Neonatologist Cloudnine Hospital, Gurugram

I have been utilizing two MiraCradle® - Neonate Coolers in my NNF Certified NICU to induce and maintain therapeutic hypothermia in newborns. The outcomes are really good.

Dr. Ravi Khanna, Ravi Khanna Hospital, Bareilly (UP)

I have been using MiraCradle® for the last five months. It is effectively maintaining hypothermia for 72 hours and has immensely helped many babies.

Dr. P. Lall, Astha Mother and Child Care Hospital, Rourkela (Odisha)
“Simplicity is the ultimate sophistication.”

Leonardo da Vinci

PLUSS®

TECHNOLOGY FOR A BETTER WORLD

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