# Infant warmer

Country of origin | United States of America

## Health problem addressed

There are over 20 million premature and low birth weight babies born each year globally, with more than 95% born in developing countries. Three million babies die within the first 28 days of their life, with more than a quarter of these deaths occurring in India alone. Those who survive often grow up to have lifelong problems such as low IQ, early onset of diabetes, and heart diseases. Hypothermia is a significant problem faced by many of these babies.

## Product description

The infant warmer works without a constant supply of electricity. It has no moving parts, and is safe and easy to use. It is also portable, enabling newborns to be kept warm during transport. One of the other big advantages of the device is that it complements Kangaroo Mother Care (KMC).It consists of three parts - a sleeping bag to place the baby, a pouch of phase change material and an electric heater. The pouch is heated for 30 mins in the heater (second version uses boiling water instead of electrcity to heat) and then placed in the sleeping bag. It maintains the WHO recommended temperature of 37 deg C for 4-6 hours, after which it can be reheated.

## Developer's claims of products benefits

In low resource areas in developing countries, common infant warming methods include blankets, hot water bottles, hot coals & light bulbs. These methods are ineffective and unsafe, often causing burns on babies. Some hospitals use a device called a radiant warmer which is expensive, needs a constant supply of electricity and is complicated to use. This innovative infant warmer is much lower cost (less than half) of other devices (mostly radiant warmers) available to treat hypothermia in low birthweight infants. It also has much lower running costs since it does not require a constant supply of electricity and faces a much lower incidence of breakdowns (almost zero). In addition, it is much easier to use and reduces the load of nurses/doctors. In comparison to make-shift solutions such as light bulbs, this is safer and effective.

## Suitability for low-resource settings

The technology is meant for use in low-resource and remote primary and secondary healthcare facilities. These facilities have intermittent access to electricity and very low doctor/nurse to patient ratio. With just 10-20 beds, these facilities may administer over 200 deliveries a month. This infant warmer works well with intermittent electricity in these settings, reduces the load of nurses/doctors due to ease of use and quicker monitoring, and does not occupy much physical space. The device has been deployed in more than 50 low-resource and remote primary/secondary government healthcare facilities across India. Doctors and nurses have given extremely positive feedback about the device's ease of use resulting in reduced workload and high quality healthcare that may otherwise not be easily available in these settings. The device has been functioning well in these settings and is in frequent use. The technology is currently being produced locally. The heater requires basic electronic components which are readily available locally. The sleeping bag is made locally using a tailor. The pouch of phase change material is also packaged locally.

## Operating steps

Sanitize all 3 components. Insert the phase change material pouch into the heater. Close the lid of the heater and push button. In 30 minutes, the alarm will ring. A green light indicates that the phase change material pouch is ready and remains lit to indicate that the heater is keeping the pouch warm.

Remove pouch, check temperature indicator, and use only if indicator bar is in OK region. Place the pouch of phase change material correctly into the sleeping bag. Wrap the newborn and tighten straps to prevent the newborn from slipping. Monitor the newborn's temperature once every hour for the next 4-6 hours. When the temperature indicator on the pouch slips into the TOO COLD region, remove the newborn. Remove the pouch and reheat as needed.

## Regulatory status

A draft CE Mark has been received. Internal processes are ISO:13485 certified.

## Future work and challenges

The target users are neonatologists and pediatricians (including those in government hospitals) who will use the warmer as a critical component of providing neonatal care for low birth weight infants, starting with those in India. Different strategies have been implemented to reach out to these practitioners including establishing a direct sales team and partnerships with pharmaceutical/medical device companies for distribution.

## Use and maintenance

**User:** Physician, nurse

**Training:** No intensive training required. Basic instructions included with device in pictorial form.
Maintenance: None

## Environment of use

**Settings:** Rural, urban settings, ambulatory, primary (health post, health center), secondary (general hospital), tertiary (specialized hospital)
**Requirements:** Intermittent supply of electricity, limited supply of water and sanitizer (to clean the sleeping bag before placing newborns). Second version of the warmer, meant for in-home use, uses boiling water instead of electricty.

## Product specifications

**Dimensions (mm):** 440 x 290 x 70
**Weight (kg):** 4.1
**Consumables:** None
**Life time:** 3 years

**Retail Price (USD):** 250
**List price (USD):** 250
**Other features:** Portable, reusable
**Year of commercialization:** 2011
**Currently sold in:** India

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