



INTRODUCING

THE THERMOSPOT™ A NON-INVASIVE
HYPOTHERMIA INDICATOR FOR
NEWBORNS, INFANTS AND CHILDREN

NOW READ ON ●●●●



THE PROBLEM.....

Four Million newborn deaths occur throughout the disadvantaged world every year from either disease, malnutrition or both!

Unknown numbers of these infants succumb to hypothermia (low core body temperature).

Hypothermia, aggravated by disease or malnutrition, is often the “opportunistic” fatal factor.

However, monitoring the temperature of newborns easily, safely and regularly can prevent this. The late Dr David Morley, first recipient of the King Faisal Award for International Health, and at the time Head of the Tropical Child Health Unit, UCL Institute of Child Health, recognised this.

Under 5 year olds mortality rate in 2007

The 10 worst countries	deaths /1000
Sierra Leone	262
Afghanistan	257
Chad	209
Equitorial Africa	206
Guinea-Bissau	198
Mali	196
Burkina-Faso	191
Nigeria	189
Ruanda	181
Burundi	180

“Indigent mothers and health care workers need a virtually no-cost, re-useable, indestructible indicator that reveals an infant’s temperature instantly, without ambiguity.”

David Morley, CBE, MD, FRCP, Late.

“We conclude that the ThermoSpot™ device is a simple accurate device allowing continuous thermal monitoring of low birth weight infants, especially in resource poor setting. Mothers quickly understood how the device worked and responded appropriately when warned of hypothermia”.

Pejaver R K, Nisarga R, Gowda B. Temperature Monitoring in Newborns Using ThermoSpot™. Indian Journal of Pediatrics. 2004;71: 795-796.



..... THE SOLUTION

No temperature indicator was ever made that could identify, quantify and instantly warn against hypothermia. Until now!

According to inventor John Zeal: “I invented *ThermoSpot™* in response to calls from front line aid workers in Africa and Asia. It is cheap, indestructible and simple to use. Even illiterate mothers can quickly grasp how to use a *ThermoSpot™* to guard against hypothermia and keep their baby warm.”

Attached to this page you will find a sample strip of *ThermoSpots™*. These deceptively simple looking little circular stickers are capable of identifying whether or not a baby’s temperature is in the safe zone (36.5–37.5°C). Their simple appearance belies an optical complexity.

ThermoSpots™ use liquid crystal technology. Each sticker contains more than a million tiny microcapsules with liquid crystals inside. Liquid crystals are special materials which have the mechanical properties of liquids and the optical properties of solid crystals. As the temperature changes, the liquid crystal molecules arrange themselves differently which causes light of different wavelengths to be reflected, which in turn, causes the *ThermoSpot™* to change colour.

ThermoSpot™ is now available to save newborn, infants and children’s lives.





THE STORY IN MORE DETAIL

Hypothermia is believed to be a direct cause of morbidity and mortality.¹ It is increasingly regarded as a global health priority.

It affects Neonates (children less than 1 month old) in particular, with prevalence rates immediately after birth reaching 85% in sub-Saharan Africa.²

Human beings have evolved to function within a narrow temperature range of 36.5 –37.5°C. When body temperatures fall below this range the body's immune system is compromised. Hypothermia is the name for this condition in which core temperature drops below that required for normal metabolism and body functions – putting individuals at risk.

Because it often goes undetected until it is too late, hypothermia kills many of these infants across tropical Africa and Asia. However if hypothermia is detected early it is highly treatable.

Dr. Morley pressed instrument-maker John Zeal to create this life-saving tool, adding: “We need urgently, in fact we need it now, a low range temperature indicator to identify hypothermia among newborns in the third world.” John Zeal responded by inventing the liquid-crystal temperature indicator, *ThermoSpot™*.

¹ Kumar et al. 2009

² Kambarami et al. 2003

“As there are so few studies in the frequency of hypothermia the ThermoSpot™ applied to all low-birth weight babies brought to health centres may start to make health workers aware of the problem of hypothermia”

Morley D, Kennedy N. Hypothermia: prevention at community level. *Tropical Doctor* 2002; 32: 22-24.

Nurses and mothers like the device because it is simple and provides reassurance that the baby is warm enough.

Morley D, Blumenthal I. A new neonatal hypothermia indicator. *Lancet* 2000; 355: 659-660

“Poorly educated mothers quickly understood how the ThermoSpot™ worked and responded appropriately when warned of hypothermia. We commend its use.”

Kennedy N, Gondwe L, Morley D C. Temperature Monitoring with *ThermoSpots™* in Malawi. *Lancet* 2000; 355: 1364.

HOW THERMOSPOT™ WORKS

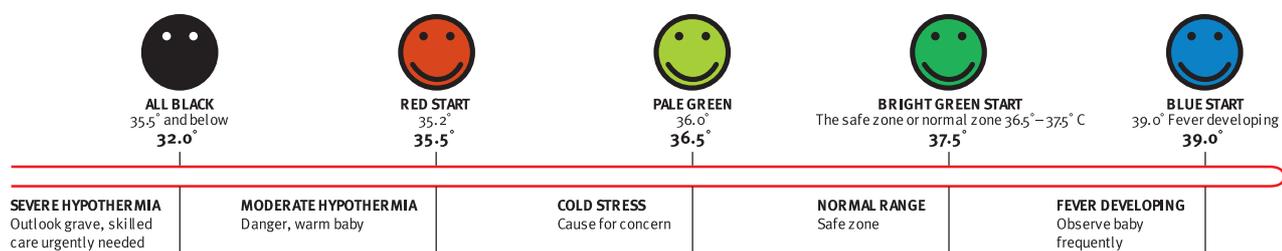
Mothers could save many newborns by using this free (to them), simple tool to reveal their baby was suffering from hypothermia.

ThermoSpot™ stickers are durable, non toxic and can be easily applied to the newborn as opposed to the more complex and invasive procedure of using a thermometer. When a newborn's core temperature is in the safe zone, an adhesive *ThermoSpot™* disk changes colour from black to bright green.



The *ThermoSpot™* may be left on the baby, or re-applied with transparent medical tape, making regular checks easy. If the colour moves away from the bright green, the mother is instantly alerted. Detecting this invisible killer, she can then press her infant between her breasts, skin to skin, as a first resort, before seeking help.

The *ThermoSpot™* is most effective when attached in specific sites on the baby. In the armpit (axilla), above the liver (hypochondrium), or on the great vessels of the neck (supraclavicular fossa). The added advantage of this third position is that the *ThermoSpot™* is still visible when the baby is covered or clothed.



For clarification purposes, this illustration highlights the temperatures at which the *ThermoSpot™* changes colour

WHO definitions of Hypothermia
(Kumar et al. 2009)

Normothermia	36.5 – 37.5°C
Mild Hypothermia	36.0 – 36.4°C
Moderate/Severe Hypothermia	less than 36.0°C

MALNUTRITION AND HYPOTHERMIA

Hypothermia is not restricted to the newborn child. Older children are also affected if they are predisposed by malnutrition.

Malnourished children may lose heat rapidly as they not only have a greater proportional surface area, but also produce less heat from metabolism in an attempt to conserve energy.³

Detected early, hypothermia 'is highly treatable'. Mothers can take simple and proven steps to re-warm

their child by skin-to-skin care and covering their child's head. In addition, care workers and staff in paediatric wards, where many malnourished children present themselves, can also take appropriate action.

Conversely, mortality rates progressively increase if detection and treatment are delayed.⁴

³ Kumar et al. 2009

⁴ Kambarami et al. 2002

"We agree with Morley and Kennedy that ThermoSpots™ are a useful tool in the monitoring of hypothermia and have demonstrated their effectiveness in older children with conditions likely to make them susceptible to hypothermia. Non-medical staff and guardians can be taught how to use them effectively."

Morrice J S, Manda L S T, Kacheche A. Hypothermia and the use of ThermoSpots™. Tropical Doctor. (Letter to the Editor) 2003;33:253.

“ThermoSpot™ is a cheap device. There were no adverse effects when it was applied over one week. It came unstuck on only four occasions. In this context, it is relevant that most cases of hypothermia occurred on the first day of life. This is in agreement with Bang et al who found that 70% of episodes of hypothermia in perinates in rural Indian homes occurred on day 1...”

Green D A, Kumar A, Khanna R. Neonatal hypothermia detection by ThermoSpot™ in Indian urban slum dwellings, Archives of Disease in Childhood – Fetal and Neonatal Edition 2006: 91: 96-98.

“Our pilot study has confirmed the ThermoSpot™ is easy to apply, acceptable, felt to be reliable and relevant to care in a developed world setting. This study has highlighted the frequency of mild hypothermia for midwifery staff, and its use will facilitate an audit of interventions to reduce the risks of hypothermia in the delivery suite and beyond. It is particularly appropriate as part of education for parents who are trying to follow advice on reducing the risk of cot death linked to overheating. Maintaining neutral-thermal neonatal environments is multifactorial, and the ThermoSpot™ may be able to play a role in the jigsaw of measures used.”

Mitchell A F M, MacFadyen. A new thermometer to prevent neonatal hypothermia. Paediatrics and Child Health. 2007: 17: 10: 410.

.....RESULTS AND CONCLUSIONS

Thermospot™ has fulfilled its primary objectives as proven in several clinical trials.

ThermoSpot™ is the only tool created expressly for illiterate mothers to detect, and rapidly respond to, hypothermia in their newborn infants. Field-tested for more than a decade from Malawi to northern India,

each tough, reusable, black plastic *ThermoSpot™* disk changes to bright green to show when a newborn’s core body temperature is in the safe zone.

It now has the potential to achieve even more...

It also has the potential for much wider application, notably older malnourished children and even beyond the developing world.

Use of *ThermoSpot™* is helping to raise awareness of the risk and dangers of hypothermia.

At present there are significant sponsorship opportunities...

Currently, a single *ThermoSpot™* disk costs under eight U.S. cents. That will drop when *ThermoSpot™* goes into large-scale production.

Sponsorship deals are now being sought in order to provide funding to expand *ThermoSpot’s™* usage. Please see overleaf for how to get in touch.

A *ThermoSpot™* disk costs the price of a nail.
For the price of that disk a life may be lost.
For the price of that disk a life may be saved.
A little life hangs on the cost of a nail,
on the cost of a *ThermoSpot™*

FOR FURTHER INFORMATION

Please contact

John Zeal

Camborne Consultants

Whitefriars, 14 Queen's Copse Lane, Holtwood, Wimborne, Dorset BH21 7EF UK

email temperaturedoc@aol.com

telephone +44 (0)1258 841032

Robert Fripp

The Impact Group

78 Sullivan Street, Toronto ON, M5T 1C1 Canada

email rfripp@rogers.com

telephone +001 416-481-7070, x29

THERMO SPOT™

Designed by The Design Unit www.thedesignunit.com

thedesignunit.com

Printed by Epic www.epicprint.co.uk

EPIC
QUALITY PRINT

"delighted to support this exciting, fascinating and worthwhile invention."