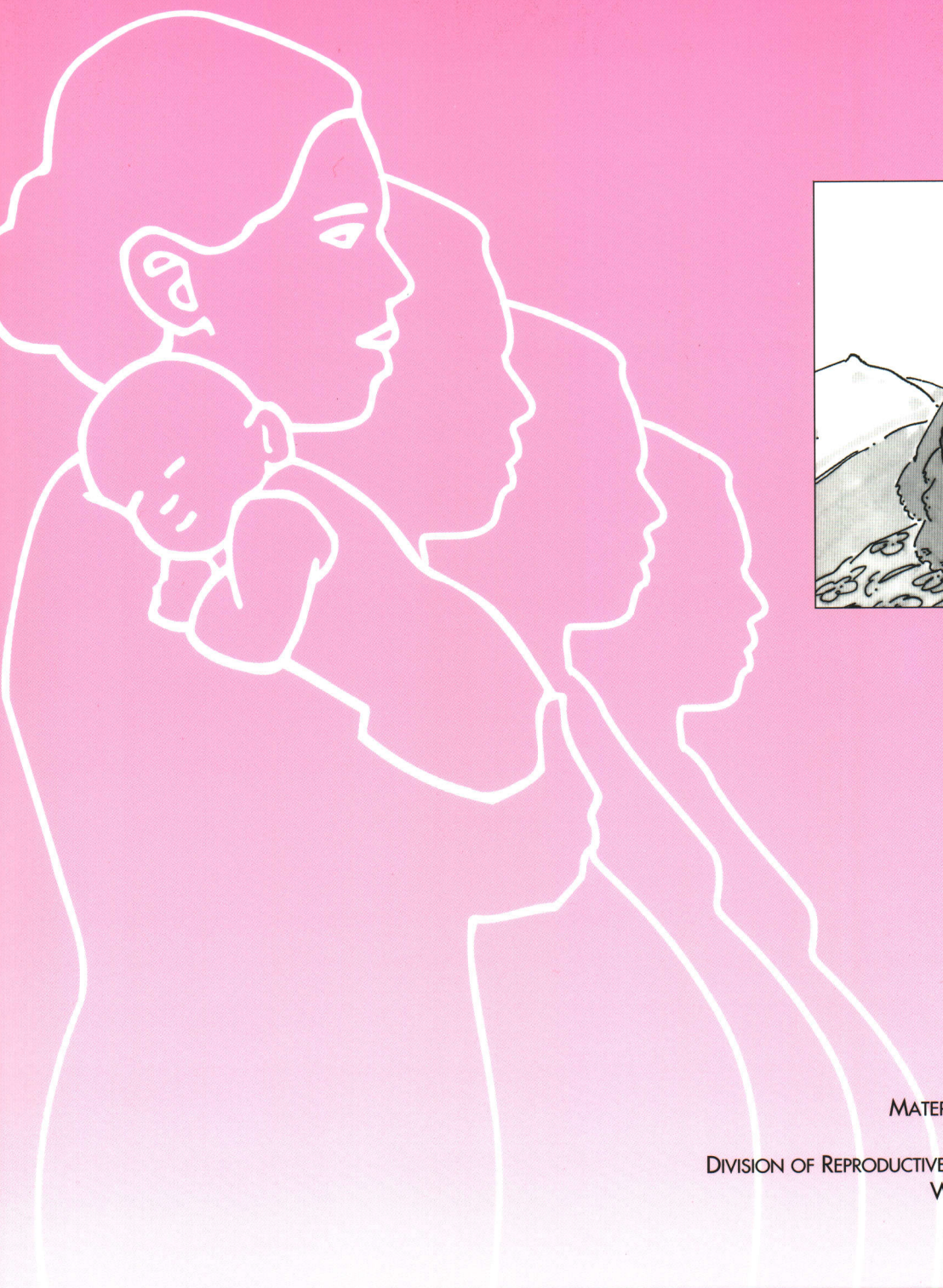


S A F E M O T H E R H O O D

Thermal Protection of the Newborn: a practical guide



MATERNAL AND NEWBORN HEALTH/
SAFE MOTHERHOOD UNIT
DIVISION OF REPRODUCTIVE HEALTH (TECHNICAL SUPPORT)
WORLD HEALTH ORGANIZATION
GENEVA

P r a c t i c a l G u i d e

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The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professions of some 189 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

These broad fields of endeavour encompass a wide variety of activities, such as developing systems of primary health care that reach the whole population of Member countries; promoting the health of mothers and children; combating malnutrition; controlling malaria and other communicable diseases including tuberculosis and leprosy; having achieved the eradication of smallpox, promoting mass immunization against a number of other preventable diseases; improving mental health; providing safe water supplies; and training health personnel of all categories.

Progress towards better health throughout the world also demands international cooperation in such matters as establishing international standards for biological substances, pesticides and pharmaceuticals; formulating environmental health criteria; recommending international non-proprietary names for drugs; administering the International Health Regulations; revising the International Classification of Diseases, Injuries, and Causes of Death; and collecting and disseminating health statistical information.

Further information on many aspects of WHO's work is presented in the Organization's publications.

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ANNEX:

EXECUTIVE SUMMARY

Thermal protection of the newborn is the series of measures taken at birth and during the first days of life to ensure that the baby does not become either too cold (hypothermia) or too hot (hyperthermia) and maintains a normal body temperature of 36.5-37.5°C (97.7-99.5°F).

The newborn infant regulates body temperature much less efficiently than does an adult and loses heat more easily. The smaller and more premature the baby, the greater the risk. After birth, the wet newborn immediately starts losing heat and unless heat loss is prevented, hypothermia will develop. Hypothermia of the newborn occurs throughout the world and in all climates and is more common than believed. This condition is harmful to newborn babies, increasing the risk of illness and death.

The temperature of the environment during delivery and the postnatal period has a significant effect on the risk to the newborn of developing hypothermia. In general, newborns need a much warmer environment than an adult. The smaller the newborn, the higher the temperature needs to be.

The "warm chain" is a set of ten interlinked procedures carried out at birth and during the following hours and days which will minimize the likelihood of hypothermia in all newborns. The room where the birth occurs must be warm (at least 25°C/77°F) and free from draughts. At birth, the newborn should be immediately dried and covered, before the cord is cut. While it is being dried, it should be on a warm surface such as the mother's chest or abdomen (skin-to-skin contact). Skin-to-skin contact with the mother is the best way of keeping the baby warm. If this is not possible, alternative means of preventing heat loss and providing warmth — such as wrapping the newborn baby and putting it in a warm room or under a radiant heater — will be necessary. Bathing and weighing the baby should be postponed.

Breast-feeding should start within one hour of delivery. This will provide the baby with calories to produce body heat.

In the days following birth, hypothermia can be prevented by keeping the baby and mother together (rooming-in), by breast-feeding as long and as often as the baby wants, and by dressing the baby appropriately for the environmental temperature.

Low birth weight or sick newborns are most vulnerable to hypothermia. Methods to keep these high-risk babies warm include kangaroo-mother care (round-the-clock skin-to-skin contact), "warm rooms", heated water-filled mattresses, radiant heaters, and incubators. A newborn baby placed in a heating device or a "warm room" should be taken out periodically for skin-to-skin contact with the mother and for breast-feeding. The body temperature of the baby should be monitored frequently.

Hypothermia occurs when the newborn's temperature drops below 36.5°C (97.7°F): 36-36.5°C (96.8-97.7°F) is mild hypothermia (cold stress); 32-36°C (89.6-96.8°F) is moderate hypothermia; less than 32°C (89.6°F) is severe hypothermia. Hypothermic newborns must be rewarmed as quickly as possible by skin-to-skin contact or any of the above-mentioned methods, depending on the availability of staff and equipment and the severity of the hypothermia.

Hyperthermia is as dangerous to the newborn as hypothermia and can be prevented by dressing the baby appropriately for the environmental temperature and not placing it too close to a source of heat or in full sunlight. In particular, incubators should not be exposed to direct sunlight, and the temperature inside the device as well as the baby's own temperature should be monitored frequently.

The information presented in this guide provides a basis on which managers and health care providers can develop their own strategies and procedures for thermal protection and management of hypothermia and hyperthermia of newborn babies.

INTRODUCTION

In the early 1900s it was realized that a warm environment was essential in the care of low birth weight newborns because they could not maintain their own body heat. Hypothermia (i.e. a body temperature below normal) has since been recognized as a significant cause of neonatal illness and death, and has been described in low birth weight as well as normal newborns, on every continent, and even in tropical countries.

In the developed world, awareness of the importance of a warm environment has resulted in improved care of the newborn, especially of preterm and low birth weight babies, who are at special risk. In many parts of the developing world, however, there is little understanding of the thermal needs of newborn babies or of the extent and significance of neonatal hypothermia. Although data are scarce, recent studies in selected countries have shown that hypothermia is still a common problem and that it contributes to the high perinatal mortality rate seen in the developing world.

This situation results more from lack of knowledge than from lack of equipment. Health personnel and mothers are not aware of the importance of keeping newborn babies warm by simple methods such as drying and covering them immediately after birth, encouraging early breast-feeding and keeping newborns in close contact with their mothers. In health facilities where managers and health workers have not received training in thermal protection, the policies and procedures necessary for maintaining a suitable thermal environment for newborn babies are lacking, and harmful practices are common. Under such circumstances, the risk of neonatal hypothermia or hyperthermia (a body temperature below normal) is considerable.

A World Health Organization (WHO) consultative group on Thermal Control met in 1992 to address this issue and suggest appropriate measures for intervention. The Maternal and Child Health Programme of the WHO issued guidelines to help programme managers and health workers understand the principles and methods for preventing and treating hypothermia (*Thermal control of the newborn: a practical guide*, WHO/FHE/MSM/93.2). The guidelines were field tested in eight countries.¹

This guide is a revised version of the first edition. It takes account of the experience gained during field testing and presents new evidence on the effectiveness of skin-to-skin contact. It focuses on the concept of thermal protection — that is, protection from both cold and heat, and the maintenance of a thermal environment that is specifically adapted to the size and gestational age of the newborn baby. The concept of the "warm chain" has been developed into a 10 step package for preventing heat loss in the newborn. The 10 steps include thermal protection at birth and in the first days of life.

¹ The countries where the guidelines were field tested are: Brazil, China, India, Indonesia, Kazakhstan, Nepal, Mozambique and Zimbabwe

The guide is designed to inform health personnel and managers in health facilities about thermal protection of the newborn and to help them put the theory into practice. It describes the principles and procedures of thermal protection of the newborn, with special reference to preterm, low birth weight and sick babies. The management of hypothermia and hyperthermia is also described, and the harmful effects of certain cultural and institutional practices are pointed out.

The guide is accompanied by a summary containing the main messages and the most essential information on thermal protection, to be adapted and/or translated by countries and used for training purposes.

The World Health Organization welcomes comments and feedback from health workers and managers in the field and would be glad to receive documentation on the subject from other experts.

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