

kangaroo
mother care

A practical guide

Department of Reproductive Health and Research
World Health Organization
Geneva

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KANGAROO MOTHER CARE

WHO Library Cataloguing-in-Publication Data

World Health Organization.

Kangaroo mother care : a practical guide.

1. Infant care - methods 2.1 n la tit care -
organization and administration
3. Infant, Premature 4. Infant, Low birth weight S. Breast
feeding
6. Guidelines 7. Manuals I. Title

ISBN 92 4 159035 1 (NLM classification: WS 410)

World Health Organization 2003

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Printed in France

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ABBREVIATIONS

- LBW Low birth weight
- KMC Kangaroo mother care
- RCT Randomized controlled trial
- RDS Respiratory distress syndrome

GLOSSARY

Terms in this glossary are listed under key words in alphabetical order.

Age

Chronological age: age calculated from the date of birth.

Gestational age: age or duration of the gestation, from the last menstrual period to birth.

Post-menstrual age: gestational age plus chronological age.

Birth

Term birth: delivery occurring between 37 and 42 weeks of gestational age.

Preterm birth: delivery occurring before 37 weeks of gestational age.

Post-term birth: delivery occurring after 42 weeks of gestational age.

Birth weight

Low -birth- weight infant: infant with birth weight lower than 2500g (up to and including

2499g), regardless of gestational age.

Very low-birth-weight infant: infant with birth weight lower than 1 500g (up to and

including 1499g), regardless of gestational age.

Extremely low-birth-weight infant: infant with birth weight lower than 1000g (up to

and including 999g), regardless of gestational age.

Different cut-off values are used in this guide since they are more useful for clinical purposes.

Body temperature

Hypothermia: body temperature below 36.5C.

Growth

Intrauterine growth retardation: impaired growth of the foetus due to foetal disorders,

maternal conditions (e.g. maternal malnutrition) or

placental insufficiency.
Milk/feeding

Foremilk: breast milk initially secreted during a breast feed.

Hind milk: breast milk remaining in the breast when the foremilk has been removed (hind

milk has a fat content and a mean caloric density higher than foremilk).

Alternative feeding method: not breastfeeding but feeding the baby with expressed breast

milk by cup or tube; expressing breast milk directly into baby's mouth.

Preterm/full-term infant

Premature or preterm infant: infant born before 37 weeks of gestational age.

Preterm infant appropriate for gestational age (AGA): infant born preterm with

birth weight between the 10 th and the 90 th percentile for his/her gestational age.

Preterm infant small for gestational age (SGA): infant born preterm with a birth weight

below the 10 th percentile for his/her gestational age.

Full-term infant small for gestational age (SGA): infant born at term with birth weight

below the 10 th percentile for his/her gestational age.

Small baby: in this guide, a baby who is born preterm with low birth weight.

Stable preterm or low-birth-weight infant: a newborn infant whose vital functions

(breathing and circulation) do not require continuous medical support and monitoring,

and are not subject to rapid and unexpected deterioration, regardless of intercurrent disease.

Note: Throughout this document babies are referred to by the personal pronoun "she" or "he" in preference to the impersonal (and inaccurate!) "it". The choice of gender is random.

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Acknowledgments

The World Health Organization wishes to acknowledge the contributions of Adriano Cattaneo, Unit for Health Services Research and International Cooperation, and Riccardo Davanzo, Department of Neonatology, at the Istituto per l'Infanzia, Trieste, Italy, who prepared the early drafts of this text. Nathalie Charpak, Zita Figueroa de Calume and Rosario Martinez, Fundacion Canguro, Bogota, Colombia, provided comments to the initial draft and valuable material for the completion of many chapters, in particular the one on ambulatory Kangaroo Mother Care. Many other experts and researchers assisted in the development of this guide; their comments and suggestions were invaluable. Among them, the World Health Organization would like to mention Gene Anderson, USA; Nils Bergman, South Africa; Kyllike Christensson, Sweden; Christiane Huriaux, France; Geisy Lima, Brazil; Ornella Lincetto, Italy; and Achmad Surjono, Indonesia.

The following WHO staff members provided technical contributions and comments: Jerker Liljestrand, Felicity Savage, Barbara Stilwell, and Martin Weber at headquarters in Geneva; and Viviana Mangiaterra at the European Office in Copenhagen.

The development of this document has been closely supervised by Jelka Zupan, Department of Reproductive Health and Research, WHO, Geneva.

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1.

Introduction

1.1 The problem - improving care and outcome for low-birth-weight babies

Some 20 million low-birth-weight (LEW) babies are born each year, because of either preterm birth or impaired prenatal growth, mostly in less developed countries. They contribute substantially to a high rate of neonatal mortality whose frequency and distribution correspond to those of poverty. 1 2 LEW and preterm birth are thus associated with high neonatal and infant mortality and morbidity. 3 ' 4 Of the estimated 4 million neonatal deaths, preterm and LEW babies represent more than a fifth. 5 Therefore, the care of such infants becomes a burden for health and social systems everywhere.

In affluent societies the main contributor to LEW is preterm birth. The rate has been decreasing thanks to better socioeconomic conditions, lifestyles and nutrition, resulting in healthier pregnancies, and to modern neonatal care technology and highly specialised and skilled health workers. 64

In less developed countries high rates of LEW are due to preterm birth and impaired intrauterine growth, and their prevalence is decreasing slowly. Since causes and determinants remain largely unknown, effective interventions are limited. Moreover, modern technology is either not available or cannot be used properly, often due to the shortage of skilled staff. Incubators, for instance, where available, are often insufficient to meet local needs or are not adequately cleaned. Purchase of the equipment and spare parts, maintenance and repairs are difficult and costly; the power supply is intermittent, so the equipment does not work properly. Under such circumstances good care of preterm and LEW

babies is difficult: hypothermia and nosocomial infections are frequent, aggravating the poor outcomes due to prematurity*. Frequently and often unnecessarily, incubators separate babies from their mothers, depriving them of the necessary contact.

Unfortunately, there is no simple solution to this problem since the health of an infant is closely linked to the mother's health and the care she receives in pregnancy and childbirth.

For many small preterm infants, receiving prolonged medical care is important. However, kangaroo mother care (KMC) is an effective way to meet baby's needs for warmth, breastfeeding, protection from infection, stimulation, safety and love.

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1.2 Kangaroo mother care - what it is and why it matters

Kangaroo mother care is care of preterm infants carried skin-to-skin with the mother. It is a powerful, easy-to-use method to promote the health and well-being of infants born preterm as well as full-term. Its key features are:

early, continuous and prolonged skin-to-skin contact between the mother and the baby;
exclusive breastfeeding (ideally);

it is initiated in hospital and can be continued at home;
small babies can be discharged early;
mothers at home require adequate support and follow-up;

it is a gentle, effective method that avoids the agitation routinely experienced in a busy ward with preterm infants.

It was first presented by Rey and Martinez, 9 in Bogota, Colombia, where it was developed as

an alternative to inadequate and insufficient incubator care for those preterm newborn infants who had overcome initial problems and required only to feed and grow. Almost two decades of implementation and research have made it clear that KMC is more than an alternative to incubator care. It has been shown to be effective for thermal control, breastfeeding and bonding in all newborn infants, irrespective of setting, weight, gestational age, and clinical conditions. 10 ' 11

Most published experience and research concerning KMC comes from health facilities, where care was initiated with the help of skilled health workers. Once a mother was confident in the care she gave her baby, she continued it at home under guidance and with frequent visits for specialised follow-up.

Evidence of the effectiveness and safety of KMC is available only for preterm infants without medical problems, the so-called stabilised newborn. Research and experience show that:

KMC is at least equivalent to conventional care (incubators), in terms of safety and thermal

protection, if measured by mortality.

J* KMC, by facilitating breastfeeding, offers noticeable advantages in cases of severe morbidity.
*t KMC contributes to the humanization of neonatal care and to better bonding between mother

and baby in both low and high-income countries. 12 ' "
* KMC is, in this respect, a modern method of care in any setting, even where expensive

technology and adequate care are available.

J KMC has never been assessed in the home setting.

Ongoing research and observational studies are assessing the effective use of this method in situations where neonatal intensive care or referral are not available, and where health workers are properly trained. In those settings KMC before stabilisation may represent the best chance of healthy survival. 14 ' 15

This guide will therefore refer to KMC initiated at a health facility and continued at home under the supervision of the health facility (domiciliary KMC). KMC as described in this document recommends continuous skin-to-skin contact acknowledging that it might not be possible in all settings and under all circumstances. The principles and practice of KMC outlined in this document are also valid for intermittent skin-to-skin contact, provided adequate care is offered to LEW and preterm newborn infants when they are separated from their mothers. Such intermittent skin-to-skin contact has been shown to be beneficial, 16 if

complemented by proper incubator care. Guidance on skin-to-skin care may be used for rewarming newborn infants with hypothermia or keeping them warm during transportation to the referral facility. 1 '

1.3 What is this document about?

This document describes the KMC method for care of stable preterm/LBW infants (i.e. those who can breath air and have no major health problems) who need thermal protection, adequate feeding, frequent observation, and protection from infection.

It provides guidance on how to organize services at the referral hospital and on what is needed to introduce and carry out KMC, focusing on settings where resources are limited.

Evidence for the recommendations is provided 18 whenever possible. However, for many statements, especially those related to secondary procedures, sound evidence is not available as in many other fields of health care. In these cases, the text reports the experience of health professionals who have implemented KMC for many years, many of whom carefully revised previous versions of this document.

For breastfeeding counselling and support, readers

should refer to Breastfeeding Counselling:
A Training Course -Trainer's Guide. 19 For HIV and
infant feeding, refer to HIV and Infant Feeding
Counselling: A Training Course -Trainer's Guide. 20

Management of medical problems of small babies is not
part of this guide. Further guidelines
can be found in textbooks or the WHO document Managing
newborn problems. A guide for
doctors, nurses and muhoives. ~ 6

1.4 Who is this document for?

This text has been prepared for health professionals in
charge of LEW and preterm newborn
infants in first referral hospitals in settings with
scarce resources.

It is not written for all potential care providers.
Practical instructions (or protocols) adapted
to the categories of health workers available in
different settings should be prepared locally.

It is also aimed at decision-makers and planners at
national and local levels. They need
to know whether KMC suits the needs of their health
systems, whether it is practical and
feasible, and what is required to implement it
successfully.

1.5 How should this document be used?

KMC guidelines have to be adapted to specific
circumstances and available resources at
national or local level. This document can be used to
develop national and local policies,
guidelines and protocols from which training material
can be developed. This document cannot,
as it stands, be used for training purposes. Other
training material and activities, especially on
breastfeeding support and counselling on HIV and infant
feeding, are needed to acquire all the
necessary skills. We hope that pre-service institutions
will include those skills in their curricula.

2.

Evidence

This chapter reviews the evidence on KMC, from both developing and developed countries, with regard to the following outcomes: mortality and morbidity; breastfeeding and growth; thermal protection and metabolism, and other effects. The experience with KMC has been reviewed by several authors, 12 ' 3 - 16 - 21 - 2 - and in a systematic review. 23 We also present evidence on the acceptability of the intervention for mothers and health-care staff.

While reviewing the evidence, regardless of the outcome, it became clear that it was important to highlight two essential variables: time of initiation of KMC, and daily and overall duration of skin-to-skin contact.

Time of initiation of KMC in the studies under consideration varied from just after birth to several days after birth. Late initiation means that the preterm/LBW infants have already overcome the period of maximum risk for their health.

Length of daily and overall duration of skin-to-skin contact also varied from minutes (e.g. 30 minutes per day on average) to virtually 24 hours per day; from a few days to several weeks. The longer the care, the stronger the possible direct and causal association between KMC and the outcome. Furthermore, when KMC was carried out over a long period of time, care was predominantly provided by the mother rather than the nursing staff or the conventional incubator.

Some other variables that might have affected the outcome of KMC are:

the position in which the baby was kept;
the changes in the type and mode of feeding;

the timing of discharge from the institution and the transition to home care;
condition at discharge;

the intensity of support and follow-up offered to mothers and families after discharge from the institution.

Many other factors (e.g. social conditions, environment and health care, especially services offered for KMC) may be associated with the positive effects observed in KMC studies. It is very important to separate the effects of these factors from those deriving from KMC. Below, in reviewing the evidence, we try to address those additional factors.

No published study on KMC was found in the context of high HIV prevalence among mothers.

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2. 1 Mortality and morbidity

Clinical trials

Three published randomized controlled trials (RCT) comparing KMC with conventional care were conducted in low-income countries. 24 ' 26 The results showed no difference in survival between the two groups. Almost all deaths in the three studies occurred before eligibility, i.e. before LEW infants were stabilised and enrolled for research. Infants weighing less than 2000g were enrolled after an average period of 3 -14 days on conventional care, in urban third-level hospitals. The KMC infants stayed in hospital until they fulfilled the usual criteria for discharge, as the control infants did, in two of the studies, 24 ' 26 while in the third study they were discharged earlier and subjected to a strict ambulatory follow-up. 25 The follow-up periods lasted one, 26 six 24 and twelve months, 25 respectively.

The RCT carried out in Ecuador by Sloan and collaborators showed a lower rate of severe illness among KMC infants (5%) than in the control group (18%). 24 The sample size required for that study was 350 subjects per group for a total

of 700 infants, but only 603 babies were recruited. Recruitment, in fact, was interrupted when the difference in the rate of severe illness became apparent. The other controlled studies conducted in low-income countries revealed no significant difference in severe morbidity, but found fewer hospital infections and readmissions in the KMC group. Kambarami and collaborators from Zimbabwe also reported reduced hospital infections. 27 High-income countries report no difference in morbidity. However, it is notable that no additional risk of infection seems to be associated with skin-to-skin contact. 24 " 2 "

Observational studies showed that KMC could help reduce mortality and morbidity in preterm/LBW infants. Rey and Martinez, 9 in their early account, reported an increase in hospital survival from 30% to 70% in infants between 1000g and 1500g. However, the interpretation of their results is difficult because numerators, denominators and follow-up in the KMC group were different from those in the historical control group. 28 Bergman and Jiiiriso, in another study with an historical control group conducted in a remote mission hospital without incubator care in Zimbabwe, 14 reported an increase in hospital survival from 10% to 50% in infants weighing less than 1500g, and from 70% to 90% in those weighing between 1500 to 1999g. Similar results are reported from a secondary hospital in nearby Mozambique. "'The difference in survival, however, may be due to some uncontrolled variables. The studies in Zimbabwe and Mozambique, conducted in hospitals with very limited resources, applied KMC very early on, well before LEW and preterm infants were stabilized. In the early study by Rey and Martinez, KMC was applied later, after stabilization. In both cases the skin-to-skin contact was maintained virtually 24 hours a day.

Charpak and collaborators, in a two-cohort study carried out in Bogota, Colombia, 29 found a crude death rate higher in the KMC group (relative risk = 1.9; 95%CI: 0,6 to 5.8), but their results reverted in favour of KMC (relative risk = 0.5, 95%CI: 0.2 to 1.2) after adjustment for

birth weight and gestational age. The differences, however, were not statistically significant. The two cohorts recruited in two third-level hospitals, showed many social and economic differences. KMC was also applied after stabilization and 24 hours a day. In a controlled but not randomized trial carried out in a tertiary-care hospital in Zimbabwe, there was a slight difference in survival in favour of the KMC infants, but this might have been due to differences in feeding. 27

Conclusion

On balance the evidence shows that although KMC does not necessarily improve survival, it does not reduce it. After stabilization, there is no difference in survival between KMC and good conventional care. The hypothesis that KMC might improve survival when applied before stabilization needs to be further explored with well-designed studies. If such an effect on survival exists, it will be more evident and easier to demonstrate in the poorest settings, where mortality is very high.

As for morbidity, while there is no strong evidence of a beneficial effect of KMC, there is no evidence of it being harmful. In addition to the little evidence already published, 14 - 15 some preliminary results on a small number of newborn infants with mild respiratory distress seem to confirm that very early skin-to-skin contact might have a beneficial effect. 30 A word of warning about discharge: KMC infants discharged during the cold season may be more susceptible to severe illness, especially lower respiratory tract infections, than those discharged during the warm season. 31 A closer follow-up is needed in such cases.

It should be noted that all the studies so far have taken place in well-equipped hospitals, yet arguably the most significant impact of KMC will be felt in settings with limited resources. There is an urgent need for further research in these settings. In the meantime, it seems that

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