Kangaroo mother care

A clinical practice guide

World Health Organization

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Cover photos (clockwise): A health worker assists a mother in breastfeeding her newborn shortly after birth ©WHO / Khasar Sandag; A mother provides KMC to her two sons © Fundación Canguro / Kangaroo Foundation; A mother provides KMC to her baby who is receiving CPAP ©Stavanger University Hospital / Siren Retteda

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Foreword

Every newborn deserves the best possible start in life. For those born too soon or too small, this beginning is especially fragile, and the care they receive in the first hours and days can determine not only their survival but their health and potential for years to come. Across the world, health workers devote their skill, dedication, and compassion to protecting these vulnerable lives. *Kangaroo mother care: a clinical practice guide* has been developed to support them in this essential, life-saving mission.

Updated after more than two decades, this Guide is far more than a compilation of evidence-based recommendations. It is a practical resource that translates science into action, showing how KMC- defined as prolonged skin-to-skin contact combined with support for exclusive breastfeeding or breast milk feeding- can be delivered safely and effectively in everyday clinical practice, including for infants who require intensive support. It also makes clear that successful implementation depends on more than clinical practice alone, and provides guidance on how to create the enabling conditions required for sustained impact, including supportive policies, adequate space and infrastructure to keep mothers and newborns together, reliable supply chains, robust data systems, and a well-trained, motivated workforce. By addressing both clinical and system-level needs, the Guide equips health workers to deliver consistent, high-quality, family-centred care and helps ensure that evidence translates into measurable results.

KMC is a proven, transformative intervention and a cornerstone of care for small and/or sick newborns. When integrated into strong health systems and delivered as part of comprehensive, high-quality newborn care, it improves survival, reduces complications, and supports healthy growth and development. Scaling up immediate KMC for all preterm or low birth weight infants from birth, across all levels of care, and into the home, can give even the most vulnerable infants the best possible chance not just to survive, but to thrive.

This Guide embodies WHO's commitment to stand with health workers everywhere, providing practical tools that save lives and improve outcomes. I hope it will inspire action, empower health teams, strengthen systems of care, and accelerate progress towards a future where no newborn dies from preventable causes and every child, everywhere, has the opportunity to reach their full potential.

Dr Jeremy Farrar

Assistant Director-General

Health Promotion, Disease Prevention and Control

World Health Organization

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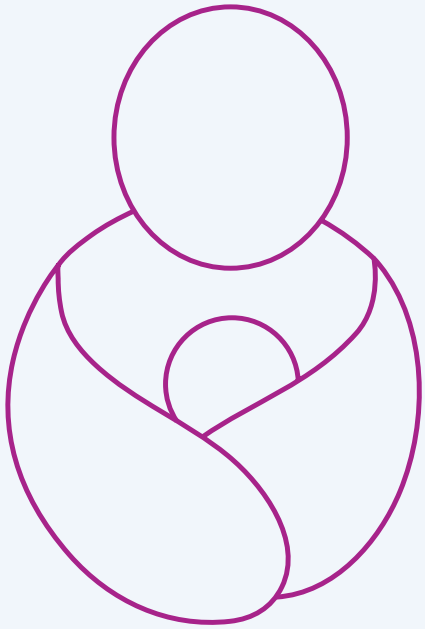
Abbreviations

CPAP	continuous positive airway pressure
ENAP	Every Newborn Action Plan
HIV	human immunodeficiency virus
KMC	kangaroo mother care
LBW	low birth weight
WHO	World Health Organization

A newborn, delivered via caesarean section, received immediate skin-to-skin contact with the father until her mother arrived in the neonatal intensive care unit, when the mother took over.

Glossary



Additional caregiver: A family member (not a health worker) who helps the mother with kangaroo mother care, including skin-to-skin contact, feeding expressed breast milk, and other routine newborn care. This person may be the newborn's father or any other family member who will, preferably, be consistently involved in the newborn's care during the birth hospitalization and after discharge.

Every Newborn Action Plan (ENAP): A global action plan developed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to eliminate preventable newborn deaths and stillbirths, endorsed by 194 Member States at the 67th World Health Assembly in May 2014 *(1)*. ENAP has joined with the Ending Preventable Maternal Mortality initiative to form a joint initiative called Every Woman Every Newborn Everywhere (EWENE) to support achievement of the global targets for reducing maternal and newborn mortality and preventing stillbirths *(2)*.

Kangaroo mother care (KMC): Care of preterm and low-birth-weight newborns in prolonged (as close as possible to 24 hours a day, with a minimum of eight hours a day) skin-to-skin contact initiated as soon as possible after birth, with exclusive breast milk feeding. An additional feature, when KMC is initiated in health facilities, is timely discharge from the neonatal intensive or special care unit to a lower level of care within the health facility or at home, with continued skin-to-skin contact and close monitoring *(3)*.

Kangaroo mother care (KMC) area: A designated area within a health facility where mothers and additional caregivers can provide KMC to preterm or low-birth-weight newborns who do not require specialized or intensive care in a newborn unit but have not yet met discharge criteria. This area can be configured within health facilities providing primary, secondary or tertiary newborn care.

Kangaroo mother care (KMC) binder (wrap): A piece of cloth used to secure the newborn in skin-to-skin contact on the mother's or additional caregiver's chest in the KMC position, ensuring the newborn's neck remains slightly extended to maintain a patent airway. The binder is often simply a piece of clothing long enough to wrap around the chest of the KMC provider that can be fastened to keep the newborn securely in place. It may also be an elastic, tube-top-like garment that holds the newborn securely without the need to fasten a knot.

Kangaroo mother care (KMC) garment: A front-opening top worn over the KMC binder while providing skin-to-skin contact. Any locally available clothing can be used, but garments made from comfortable, weather-appropriate materials that are easy to clean are preferred. The design varies, depending on the type of binder used.

Kangaroo mother care (KMC) position: In this position, the newborn lies in direct skin-to-skin contact on the chest of the mother or the additional caregiver, between the

breasts, in a prone and vertical position. The newborn's head is turned to one side, and the neck is slightly extended to ensure the airway is patent. The arms, hips and knees are flexed, and the hips are partially abducted. The position is referred to as the "kangaroo position" in Kangaroo mother care: A practical guide *(4)*.

Low birth weight: Birth weight less than 2500 g.

Mother–newborn care unit: A newborn care unit providing level 2 (special) or level 3 (intensive) newborn care where mothers or additional caregivers can stay continuously with their preterm or low-birth-weight newborns. The mother or additional caregiver has a bed beside the newborn to ensure continuous stay and care. Both the newborn and mother receive postnatal care tailored to their clinical conditions.

Preterm: Describes a newborn delivered at a gestational age of less than 37 completed weeks.

Glossary references

1. Every newborn: an action plan to end preventable deaths. Geneva: World Health Organization; 2014 (https://iris.who.int/handle/10665/127938).

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3. Kangaroo mother care: a transformative innovation in health care – global position paper. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/367626).

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Mother and father practice skin-to-skin contact with their twins

Overview

This guide is designed to help health workers support mothers and families in practising Kangaroo Mother Care (KMC) in health facilities at all levels of care and home. It also provides brief guidance for health facility administrators and program managers on what they need to do to support KMC practice in health facilities.

Section 1. Introduction to the guide

This section introduces the Guide – why and how it was prepared, who it is for, and how to use it. This section is relevant for all readers.

Section 2. Understanding KMC

This section explains what KMC is, why it is important, and the key aspects of KMC practice that align with the latest evidence or best practice. This information will be useful for those who are unfamiliar with KMC, as well as for experienced health workers.

Section 3. Implementing KMC: requirements for health facilities

This section explains how KMC can be implemented as a core component of small and/or sick newborn care at all health system levels. It outlines the essential requirements and actions for implementing KMC in primary, secondary and tertiary-level health facilities and at home. This information is useful for health facility administrators, program managers, and senior health workers who are in a position to influence and strengthen facility-level processes.

Section 4. Providing KMC in health facilities

This section provides practical guidance for health workers on supporting mothers and families in practising KMC in health facilities starting at birth and continuing through to discharge. It is intended for those directly involved in providing maternal and newborn care within health facilities.

Section 5. Supporting mothers and families to practise KMC at home

This section describes how mothers and families can be supported in practising KMC at home. This section is relevant for program managers and community-based health workers involved in supporting maternal and newborn care at the community level.

References

This section provides references to some key information included in this guide.

Key updates

1. Immediate KMC and KMC at home

- New guidance included on immediate KMC (i.e. starting KMC as soon as possible after birth), even for newborns requiring special or intensive care, includes step-by-step instructions and videos.
- Guidance also covers continuation and initiation of KMC at home, following latest WHO recommendations.

2. Use of the term “kangaroo mother care” (KMC)

- KMC refers to the combined practice of prolonged skin-to-skin contact (SSC) and breast milk feeding.
- If only one component is being discussed (e.g. SSC), only that specific term is used.
- KMC is not used for skin-to-skin contact, provided by additional caregivers, to emphasize the mother’s central role.
- The term “skin-to-skin care” is not used, as it may refer to any SSC, regardless of duration, position and/or feeding.

3. Terminology update: “Kangaroo position” – “KMC position”

- The term “kangaroo position” has been replaced with “KMC position” to improve clarity and global relevance as the word “kangaroo” may not be well understood in all contexts.
- The description of the newborn’s position has been revised for accuracy. Terms such as “frog-leg” and “fetal” have been removed, as:
  - “frog-leg” positioning is not standardized and varies widely;
  - the fetal position typically involves a flexed head, which is unsafe.

4. Discharge and follow up

- KMC can lead to earlier discharge, but specific discharge criteria are not included in this guide, due to wide variations in discharge criteria across countries and the difficulty of standardizing it globally. Instead, general guidance is provided to allow country-level adaptation.
- Follow-up care for small and/or sick newborns is also kept broad, recognizing differing health system capacities and evolving global guidance.

A mother provides KMC to her preterm newborn requiring continuous positive airway pressure (CPAP), with support from her partner.
© General TWG Hospital / Kim Chi Luong

Section 1

1. Introduction to the guide

1.1 Context for updating Kangaroo mother care: a practical guide

The World Health Organization (WHO) first recommended kangaroo mother care (KMC) and published *Kangaroo mother care: A practical guide* in 2003 *(1)*. Since then, substantial evidence has emerged on the benefits of KMC, its implementation across the health facility–community continuum, and its initiation immediately after birth for preterm (gestational age less than 37 weeks) or low-birth-weight (LBW; birth weight less than 2500 g) newborns requiring specialized care *(2–4)*. WHO updated its recommendations in 2022 to reflect this evidence *(5)*, supported by the development of a global position paper *(6)* and implementation strategy for KMC *(7)*.

This updated guide aligns with the latest recommendations and integrates key insights to support effective KMC practice in health facilities and at home. It aims to equip health workers with practical tools and insights to deliver and sustain KMC as the standard of care for all preterm or LBW newborns.

1.2 Process of developing this guide

This guide was developed by WHO in collaboration with a global working group of KMC experts from diverse contexts.[1] It is grounded in the latest WHO guidelines on KMC, breastfeeding, and maternal and newborn care. The guide focuses on facilitating KMC while addressing key aspects of small and/or sick newborn care directly relevant to KMC.

Views regarding some aspects of KMC practice vary among experienced practitioners and across different contexts and settings. When differences in opinions or practices were identified, decisions were guided by existing WHO recommendations. In the absence of relevant WHO guidelines, guidance from other global organizations – reviewed and vetted by WHO subject experts – was used to inform the content. Where no evidence or formal guidance was available, expert opinions from global KMC specialists and experienced practitioners shaped the content. Expert consensus ensured the guidance remains current, practical and safe.

WHO sought extensive feedback from global experts and end-users, ensuring technical accuracy and usability. Accompanying materials such as videos were developed and reviewed by relevant experts. External or third-party resources were included when they were publicly available and aligned with WHO guidance, with necessary permissions. The content and resources in the guide will be updated as evidence and practices evolve.

Use of specific terminology has been minimized. Instead, practices and processes are described and illustrated to ensure clear and effective communication.

1.3 Intended audience

This guide is primarily for health workers directly supporting mothers and families to

[1] All working group members declared any competing interests (whether academic, financial, or other), using the standard WHO DOI form. None of the declared interests were considered serious enough to pose any risk to the development process or content of the guide or to reduce its credibility.

Health workers attending a mother with newborn in KMC at a hospital. © WHO / Yoshi Shimizu

practise KMC. It provides practical evidence-based guidance for various settings (health facility and community, low- and high-resource settings) and various health worker roles (i.e doctors, nurses, midwives, community health workers). Policy-makers, programme managers and facility administrators will find guidance on creating supportive environments and providing essential resources to enable effective KMC practice in Section 3.

1.4 How this guide is intended to be used

This guide is designed to support the development of national policies and guidelines, pre-service and in-service education and training curricula, and health facility protocols for newborn care. It serves as a reference for creating training materials and guiding KMC-related practices, with adaptations possible to suit local contexts, such as resources and case-mix. The guide includes learning and orientation resources, but it is not intended as a standalone training tool. Health workers should acquire practical skills through hands-on training in facilities that practise KMC.

The guide assumes the existence of functional health systems that provide essential maternal and newborn care, and that health workers possess the necessary knowledge and skills to care for small and/or sick newborns, in line with the level of care they provide.

KMC adaptations based on local experience are highlighted where relevant, enabling health workers to tailor practices to their specific context.

A mother breastfeeds her newborn in skin-to-skin contact. © General TWG Hospital / Kim Chi Luong

Section 2

2. Understanding KMC

2.1 What is KMC?

KMC is the care of a preterm or LBW newborn in prolonged (as close as possible to 24 hours per day, with a minimum of eight hours per day) skin-to-skin contact initiated as soon as possible after birth, with exclusive breast milk feeding. An additional feature of KMC initiated in health facilities is timely discharge from the neonatal intensive care or special care unit to a lower level of care within the health facility or at home, with continued skin-to-skin contact and close monitoring.

WHO recommends KMC as essential care for all preterm or LBW newborns, starting as soon as possible after birth, even if the newborn is clinically unstable, unless the newborn is haemodynamically compromised or unable to breathe on their own. KMC can be started in a health facility or at home. Skin-to-skin contact should be prolonged and carried out for as many hours as possible every day, the ideal being 24 hours per day and the minimum being at least eight hours a day (Box 1) *(5)*.

Ideally, skin-to-skin contact should be provided primarily by the mother, but it can also be performed by an additional caregiver, such as the father or another family member. When not in skin-to-skin contact with the mother or additional caregiver, the newborn should be kept in a thermal environment that maintains normal body temperature.

WHO recommends skin-to-skin contact during the first hour after birth to prevent hypothermia and promote early breastfeeding initiation for all newborns without complications *(8)*. This practice should be followed for every newborn, regardless of gestational age or birth weight.

Box 1. WHO recommendations on KMC

Recommendation 1: KMC immediately after birth

KMC should be initiated as soon as possible after birth for all preterm or LBW newborns.

Recommendation 2: KMC for all preterm or LBW newborns

KMC is recommended as routine care for all preterm or LBW newborns. KMC can be initiated in a health facility or at home and should be given for 8–24 hours per day (as many hours as possible).

For preterm or LBW newborns, skin-to-skin contact continues beyond the first hour, throughout the hospital stay and at home after discharge, until the newborn reaches term age or "wriggles out". This prolonged, sustained skin-to-skin contact, combined with exclusive breast milk feeding, is what defines and distinguishes KMC from the routine skin-to-skin contact recommended for all newborns in the first hour after birth.

2.2 Why KMC is important

KMC offers numerous benefits for newborns and mothers. It also positively impacts fathers, families and health systems. Growing evidence highlights its wide-ranging benefits for populations, societies and nations as a whole (Box 2).

Box 2.

Key benefits of KMC

Immediate benefits for newborns include:

- 32% reduction in neonatal mortality and 25% reduction in mortality by age six months *(9)*;
- 68% reduction in hypothermia at discharge or by 28 days after birth *(9)*;
- 15% reduction in severe infections or sepsis *(9)*;
- 48% increased duration of exclusive breastfeeding at discharge or by 28 days after birth *(9)*;
- better weight gain *(9)*;
- decreased length of hospital stay *(10)*;
- early initiation of breastfeeding *(11)*;
- reduced hypoglycaemia *(12)*;
- improved overall physiological regulation (improvements in respiratory rate, oxygenation and temperature) *(12)*;
- protection from pain *(13)*;
- optimal developmentally supportive care *(14)*.

Longer-term benefits for newborns include:

- improved brain development and function (e.g. intelligence, attention, memory, coordination) *(15)*;
- improved academic performance; reduced school absenteeism, hyperactivity, aggressiveness and externalization disorders; likely to be more protective and nurturing as parents; likely to receive higher hourly wages *(16,17)*.

Benefits for mothers, fathers and family include:

- facilitates respectful maternity care *(18)*;
- promotes meaningful participation of parents as part of quality care for small and/or sick newborns *(19)*;
- promotes mother–newborn bonding *(20)*;
- decreases maternal anxiety and depression *(20)*;
- reduces postpartum haemorrhage *(21,22)*;
- fathers and other family members may experience increased bonding and attachment with their newborn, increased confidence as caregivers, and enhanced mental health and well-being *(23)*.

Benefits for health workers include:

- enhanced job satisfaction and empowerment *(24)*.

Benefits for health facilities, health systems and nations include:

- reduced health-care expenditure – the cost of providing KMC in a health facility is lower than that of conventional newborn care; the incremental cost–utility ratio of KMC compared with conventional care is estimated to be US$ 1546 lower per extra quality-adjusted life-year gained, as of 2017 *(25)*;
- promotes sustainable development *(26)*.

This evidence underscores the importance of integrating KMC as the essential care for all preterm or LBW newborns, alongside other standard interventions for the effective management of small and/or sick newborns. It is crucial for all health workers – including clinical staff (doctors, nurses and midwives), support staff (other medical and paramedical personnel) and administrative staff in health facilities – to understand the evidence supporting the benefits of KMC.

2.3 Who should receive KMC?

KMC should be provided to all preterm or LBW newborns, regardless of their clinical condition, unless they are haemodynamically unstable or unable to breathe spontaneously. KMC is suitable even for newborns requiring medical interventions, such as non-invasive respiratory support and continuous medical support and monitoring. The presence of some major congenital malformations (e.g. abdominal wall defects), however, may make skin-to-skin contact in the KMC position unfeasible.

WHO currently does not specify a lower gestational age or birth weight threshold for practising KMC in health facilities. Few studies have included extremely preterm (i.e. gestational age less than 28 weeks) or extremely LBW (e.g. birth weight less than 1 000 g) newborns, and there is only limited evidence to guide recommendations. It is recognized, however, that experienced newborn care units often provide KMC to these newborns, with close and continuous monitoring (Suman Rao and Harish Chellani, personal communication, 13 November 2024).

2.4 Who can provide KMC?

The primary caregiver for KMC should be the mother, who should be encouraged and supported to provide KMC as much as possible. Skin-to-skin contact with the mother stimulates production of breast milk, promotes exclusive breastfeeding, and exposes the newborn to beneficial microbiota that strengthen immunity. All mothers, regardless of age, parity, education, culture, religion and socioeconomic status, can practise KMC, unless the mother has a medical contraindication (e.g. uncontrolled epilepsy, mental illness affecting routine caregiving, contagious skin infection). Minor illnesses such as respiratory infections (including COVID-19) are not contraindications if proper hand hygiene and precautions (e.g. wearing a facemask) are followed.

An additional caregiver can also provide skin-to-skin contact and care for the newborn, including feeding expressed breast milk and attending to other needs, such as diaper changes (Fig. 1). This role is particularly important to give the mother time to rest and care for herself while ensuring the newborn continues to receive prolonged skin-to-skin contact and necessary care. The presence of an additional caregiver is particularly important if the mother is severely ill, is under the influence of general anaesthesia or sedatives, or chooses not to provide KMC, until she is able or willing to resume KMC. Ideally, the additional caregiver should be a person who will preferably, be consistently involved in the newborn's care during and after the birth hospitalization, such as the newborn's father. Identifying additional caregivers and orienting and preparing them for KMC before birth is essential to ensure continuity of care.

Fig. 1. Additional caregivers providing KMC

Grandmother of a newborn admitted to a level 2 mother–newborn care unit providing skin-to-skin contact

Father providing skin-to-skin contact

Newborn in skin-to-skin contact with her father, supported by her mother and siblings

2.5 Where KMC should be provided

KMC can be provided in health facilities offering any level of newborn care and also at home (Table 1).

Table 1. Supporting KMC in health facilities providing different levels of care

Level and type of care[a]	Newborns eligible for KMC	Where to start and continue KMC	Other evidence-based interventions expected at corresponding level of care
Level 1: primary Essential newborn care	All preterm or LBW newborns who do not require higher level of care [b]	Initiate KMC immediately after birth: • In the labour room for vaginal births • In the operating theatre for caesarean births Start skin-to-skin contact with the additional caregiver if the mother is severely ill[c] Continue in KMC area until discharge,[d] and then at home	• Drying • Delayed cord clamping • Neonatal resuscitation if necessary • Early initiation and support for breastfeeding • Vitamin K, eye care, vaccinations, history and physical examination, treat risk of infection • Targeted care as necessary (e.g. prevention of vertical transmission of HIV) • Identification and referral for complications • Pre-discharge advice on maternal and newborn care and follow up
Level 2: secondary Special newborn care	All preterm or LBW newborns, including those who need level 2 (special) care, unless a higher level of care is required [b]	Start KMC immediately after birth in childbirth areas, as described above Continue KMC in the newborn care unit or if available, mother–newborn care unit, where the mother or additional caregiver can stay with the newborn on a 24/7 basis After the newborn's condition improves, continue KMC in stepdown or KMC area until discharge,[d] and then at home	Services available at level 1, plus: • Thermal care, including radiant warmers or incubators • Assisted feeding (e.g. tube feeding) • Safe administration of intravenous fluids and oxygen • Prevention of apnoea • Detection and management of neonatal complications (e.g. infection, hypoglycaemia, jaundice, anaemia, encephalopathy, seizures) • Detection and referral management of birth defects • Transitional care, including continuous positive airway pressure (CPAP), exchange transfusion, and follow up of high-risk newborns

Level and type of care[a]	Newborns eligible for KMC	Where to start and continue KMC	Other evidence-based interventions expected at corresponding level of care
Level 3: referral or tertiary Intensive newborn care	All preterm or LBW newborns, including those who need level 3 (intensive) care, unless newborn is in shock or requires mechanical ventilation	As above Newborns in shock or requiring mechanical ventilation can receive KMC when they are haemodynamically stable and/or no longer require mechanical ventilation	Services available at levels 1 and 2 plus: • Invasive ventilation, surfactant treatment • Advanced feeding support (e.g. parenteral nutrition) • Investigation and management of birth defects • Screening for and treatment of retinopathy of prematurity • Genetic services • Paediatric surgery

[a] Level and type of care in health facilities is defined as per the Every Newborn Action Plan *(27)*.

[b] Newborns requiring a higher level of care should be referred to an appropriate health facility, ideally in skin-to-skin contact with the mother or an additional caregiver.

[c] If an additional caregiver begins skin-to-skin contact, it is preferable to keep the mother in the same room as the newborn, provided the mother's medical condition permits, and transfer them together when feasible. If the mother is severely ill and requires specialized or intensive medical care, the additional caregiver should remain with the newborn, providing prolonged skin-to-skin contact until the mother is ready to resume KMC. Expressed breast milk should be provided to the newborn as far as possible.

[d] KMC can occur in any space that is configurable to support it.

KMC should continue at home following discharge from a health facility.

For home births, preterm or LBW newborns who do not require specialized care in a health facility (e.g. those above the gestational age or birth weight threshold for admission to a newborn care unit, as per the national guidelines and without danger signs), KMC should be started at home. Postnatal contact by a trained health worker is recommended as soon as possible within 24 hours after home birth for all newborns. If the preterm or LBW newborn requires specialized care in a health facility, but referral is not feasible or accepted by the family, initiating KMC at home offers a better chance of survival than no care at all.

Community-based maternal and newborn care, including KMC, should be delivered in accordance with existing country-specific guidelines and mechanisms. Detailed information on supporting KMC at home is provided in Section 5.

2.6 How long should KMC continue?

KMC should continue for as long as the newborn accepts it. Typically, newborns consistently attempt to wriggle out of the KMC position when they reach a weight of about 2500 g or corrected gestational age[2] of 38–40 weeks. At this point, the preterm or LBW newborn can maintain normal temperature without skin-to-skin contact, and skin-to-skin contact can be stopped. Some newborns, such as those born small for gestational age, may reach maturity earlier and wriggle out at a lower weight.

[2] Corrected gestational age is the newborn's chronological age adjusted for how early they were born. For example, if a newborn is delivered at 36 weeks (4 weeks before the full 40 weeks of gestation) and then reaches 4 weeks of age after birth, their corrected gestational age is 40 weeks – meaning they are considered term at that point. This adjustment offers a more accurate understanding of the newborn's growth and developmental milestones, reflecting the progress they would have made had they been born at full term.

A mother provides KMC to her newborn, recently weaned from CPAP, in the mother–newborn care unit. © Safdarjung Hospital / Harish Chellani

Section

3

3. Implementing KMC: requirements for health facilities

KMC can be implemented in all health facilities providing newborn care, whether at the primary, secondary or tertiary level. Table 2 outlines the key requirements for optimal KMC implementation at health facilities at different levels. These can be adjusted according to available resources and feasibility.

Table 2. Requirements for KMC implementation in health facilities providing different levels of care

	Primary level	Secondary or tertiary level
Policies and protocols	**Essential:** • KMC-supportive policies that enable the mother to stay with her newborn 24/7 and enable coordinated care for mothers and newborns • Policies and protocols to allow additional caregivers and family to support the mother in providing KMC	**Essential:** • Same as for primary level
	Desirable at all levels: • Standardized protocols for management of small newborns, including KMC, discharge criteria and discharge preparedness • Quality assurance and quality improvement protocols	
Infrastructure	**Essential:** Childbirth areas: • A wide, reclinable bed with side-rails to keep the mother and newborn in skin-to-skin contact in the first hour after birth • Space for additional caregiver to start skin-to-skin contact if required	**Essential:** Childbirth areas: • Same as for primary level

	Primary level	Secondary or tertiary level
	Newborn care areas: • Dedicated space for the mother or additional caregivers to provide KMC with adequate privacy (e.g. curtains, folding screens) • Toilet, shower and handwashing area with soap and water • Eating area for mother and additional caregivers • Area for expressing and storing breast milk	Newborn care areas: • Level 2 or level 3 newborn care unit where mother or additional caregiver can stay with their newborn on 24/7 basis • Remainder same as for primary level
	Desirable at all levels: • Family waiting room and counselling room	
Equipment and supplies	**Essential:** Childbirth areas: • Recliner bed and chairs • KMC garments and binders • Wheelchair for transport • Equipment and supplies for postnatal care of mother (e.g. blood pressure cuffs) • Equipment and supplies for essential newborn care (e.g. resuscitation kit)	**Essential:** Childbirth areas: • Same as for primary level Newborn care areas: • Equipment and supplies for level 2 newborn care (e.g. radiant warmer, standard CPAP machine that provides humidified blended oxygen, pulse oximeter)
	Desirable at all levels: • Breast pumps • Audiovisual aids for training and counselling • Standard operating procedures in local languages to guide implementation • Health education materials • CPAP machine with blended oxygen for transport	
Health facility records	**Essential:** • Birth registers with gestational age, birth weight, and time of starting skin-to-skin contact and breastfeeding after birth • Newborn clinical records to include KMC-specific variables (e.g. age at initiation of KMC, duration of skin-to-skin contact per day, frequency of exclusive breastfeeding)	**Essential:** • Same as for primary level
	Desirable at all levels: • Data dashboards to monitor key indicators of small and/or sick newborn care, including KMC	

	Primary level	Secondary or tertiary level
Health workforce: numbers and capacity	**Essential:** • Adequate number of health workers trained in newborn and maternal care according to level of care provided in the health facility • Adequate staff with strengthened competency and motivation to support, supervise and monitor KMC • Hands-on training in essential care for small newborns including KMC, with on-the-job support • Training in counselling skills	**Essential:** • Same as for primary level, plus training in supporting KMC for small newborns who are sick and need level 2 care or above, with on-the-job support
	Desirable at all levels: • Regular refresher training for health workers on care of small newborns, including KMC	
Maternal and newborn service delivery	**Essential:** • Essential coordinated postnatal care for both mother and newborn, ensuring they are cared for together without separation from birth until discharge • Counselling for mothers and additional caregivers on KMC and routine mother–newborn care, including discharge preparation and support • Access to referral and transport services • Free food and clean drinking water for mothers and additional caregivers	**Essential:** • Same as for primary level, plus: • Special or intensive newborn care, depending on newborn's clinical condition • Postnatal care for mother, according to her condition, even when inside the newborn or mother–newborn care unit
	Desirable at all levels: • Routine clinical audits and PDSA cycles to identify care gaps, analyze root causes, and implement targeted, data-driven improvements	
Costs of care (facility operating expenses and service fees)	**Essential:** • Dedicated budget for supporting running costs of KMC, including KMC garments and binders, teaching and training activities, and clean drinking-water and food for mothers and additional caregivers	**Essential and Desirable:** • Same as for primary level
	Desirable at all levels: • Subsidized costs of care, especially for mothers and newborns requiring prolonged stays	

3.1 Favourable health facility policies and protocols

Respecting, empowering and supporting the mother as the primary caregiver is essential for effective KMC implementation. The mother's trust in health workers and her involvement in the newborn's care depends on how she is treated and the quality of her postnatal care. Facility leadership must create optimal conditions that enable mothers to stay with their newborns after birth, respecting their right to remain together. Additionally, they should establish mechanisms that ensure combined and respectful maternal–newborn care. Mothers should be able to stay with their newborns, even if the newborn is preterm, low birth weight, or unwell and receiving care in the newborn unit. At the same time, their own needs should be met, including access to clean water, nutritious food, hygienic toilets, bathing facilities, and essential medical care. This requires supportive policies and strong coordination between maternal and newborn health workers. Additionally, family members should be encouraged to visit and assist with KMC, irrespective of the location of the newborn.

3.2 Infrastructure

In childbirth areas, space should be available for the additional caregiver to start KMC immediately after birth if the mother is unable to do so. The space can have a reclinable bed or chair with access to other supplies such as KMC garments and binders, a pulse oximeter and a wheelchair for transport.

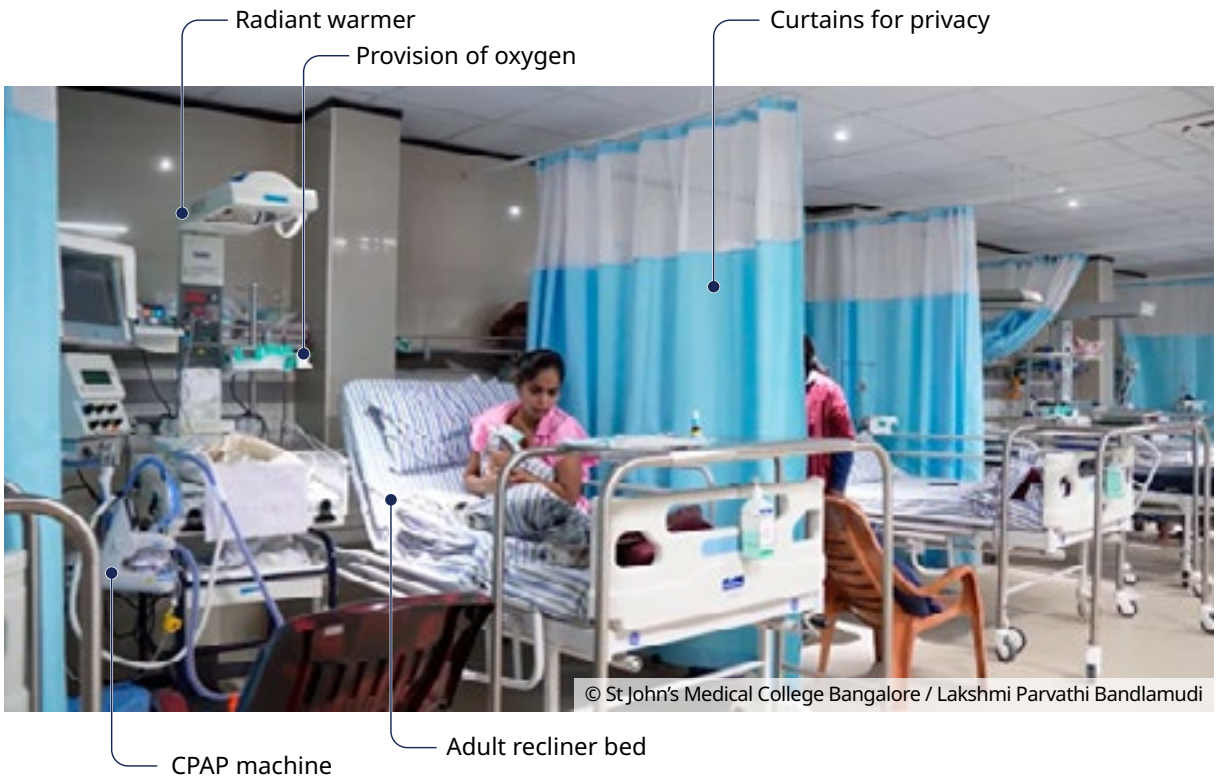
In newborn areas in primary-level facilities, it is sufficient to have dedicated space for the preterm or LBW newborn to receive KMC with their mother until the mother and newborn can be discharged home. These newborns are at higher risk of complications than healthy, term newborns of normal birth weight and require close monitoring until discharge; therefore it is not ideal to keep them in a routine postnatal ward. A dedicated space for KMC (the KMC area) can be created in any available space in the facility that can be configured to provide KMC.

In secondary- and tertiary-level facilities that have a newborn care unit, the mother is currently usually separated from the newborn if the newborn is too small or sick and requires specialized or intensive care. The mother may be able to visit the newborn only intermittently, delaying the initiation of KMC and limiting the daily duration of skin-to-skin contact. To address this, the WHO-coordinated, multi-country Immediate KMC Study introduced the concept of a mother–newborn care unit. This was a level 2 newborn care unit that enabled mothers to stay and care for their small and sick newborns on a 24/7 basis (4). This setup enabled early initiation of KMC within two hours after birth, even for small and/or sick newborns requiring level 2 care, and could achieve prolonged skin-to-skin contact for almost 17 hours a day, reducing neonatal mortality by 25%.

A mother–newborn care unit is a standard level 2 or level 3 newborn care unit with a bed for the mother beside the radiant warmer or incubator (Fig. 2 and Video 1). The mother stays with the newborn on a 24/7 basis and has access to postnatal care until transferred out with the newborn. The unit offers clean drinking-water, a clean toilet and bathing area, a dining area and storage space for the mother and additional caregivers. For toilets attached to the unit, there is a buffer area with handwashing facilities between the toilet and the main unit for added privacy and hygiene.

Fig. 2. Mother–newborn care unit: a level 2 or level 3 newborn care unit where the mother–newborn dyad is cared for together on a 24/7 basis

Freestanding mother–newborn care unit



A shared space for mother and newborn integrated within a larger unit

Note: The shared space for the mother and newborn may be a freestanding unit or integrated within a larger ward or care unit, depending on the facility setting.

Fig. 3. Conventional newborn care unit

Mother and additional caregivers providing KMC in a conventional newborn care unit

Note: Regular chairs are being used instead of dedicated KMC chairs. Whenever possible, KMC chairs should be used in such interim arrangements, as they offer greater comfort and better support prolonged skin-to-skin contact.

Existing special care or intensive newborn care units can be converted into mother–newborn care units through design adaptations by placing a bed for the mother next to the newborn. Staff education and training are essential to support KMC for small and/or sick newborns and to provide the necessary postnatal care and monitoring for the mother.

If space for a bed for the mother is unavailable, plans should be made for structural changes during the next newborn unit renovation. As an interim solution, the unit can be opened 24/7 to parents, with comfortable seating or reclining chairs provided next to the newborn bedside (Fig. 3). This can often be achieved with minimal renovation or reconfiguration.

Video 1

Mother–newborn care unit

https://who.canto.global/b/GJ1MI

Preterm or LBW newborns who are transferred out of a newborn special or intensive care unit after their clinical condition improves can be cared for in the KMC area until they meet the criteria for discharge (Fig. 4).

Fig. 4. Dedicated KMC ward for stable newborns

Preterm or low-birth-weight newborns receiving KMC in a dedicated ward

3.3 Equipment and supplies

In childbirth areas, a wide reclinable bed with side-rails for safety is desirable, to allow for the transfer of the mother from the labour table, ensuring she can maintain skin-to-skin contact in the first hour after birth while still being monitored (Fig. 5). Curtains can be used to maintain privacy. In addition to routine equipment for essential newborn care – such as clean, warm clothes for drying, a resuscitation kit, a suction device, a stethoscope, oxygen, CPAP for level 2 units, and a pulse oximeter for monitoring the newborn's oxygen saturation – KMC garments and binders and a wheelchair or transportable bed should be readily available.

In newborn care areas, in addition to all essential equipment for standard newborn care, based on the level of care required, KMC-specific supplies such as reclinable beds, KMC chairs, and KMC garments and binders should be readily available. Different types of chairs may be used in various settings (Fig. 6). It is essential that the chair is comfortable, sturdy and, ideally, reclinable. The chair must provide adequate support for the mother or additional caregiver's back and legs. The mother should be provided with at least two sets of KMC garments and binders to prevent interruptions in KMC during washing and drying.

Fig. 5. A recliner bed being used for KMC

Mother provides KMC to her small and sick newborn in a level 2 mother–newborn care unit

Fig. 6. Various types of chairs used for KMC

A mother providing KMC to her small newborn in the level 2 mother–newborn care unit at a district hospital

A father holding a newborn in skin-to-skin contact while the mother takes a break in KMC ward

An aunt provides skin-to-skin contact to one of two newborn twins at a district hospital

Note: Any comfortable chair that provides adequate back and leg support, and allows the mother or caregiver to remain in a seated or semi-reclined position for an extended period, can be used for KMC.

KMC binders for carrying the newborn skin-to-skin can be made in various ways, including using locally available cloth (Fig. 7), tube-type binders made of an elastic fabric (Fig. 8), or custom-made pouches (Fig. 9). Any binder that can securely position the newborn between the mother's breasts and maintain the newborn's head and neck in a slightly extended position to allow for free breathing can be used (Video 2). The binder should be able to support the newborn's weight when the mother is standing and prevent shifting or falling from the chest with lateral movement of the mother. Ideally, the binder should permit the mother to position the newborn and tie and untie the binder independently (see Section 4).

Fig. 7. Plain cloth used as a binder

Mother using a plain cloth binder to provide KMC to her newborn twins

Note: Tied using a knot on the side, a cloth binder requires additional support from below, provided by the outer KMC garment tied underneath, to prevent the newborn from slipping down

Fig. 8. Tube type binders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Note: Made of lycra or other elastic and flexible fabric, a tube type binder may not require additional support from an outer KMC garment

Fig. 9. Customized binders


© WHO / Blink Media – Hilina Abebe

Ready-made binder


© General TWG Hospital / Kim Chi Luong

Self-made binder created by folding locally available cloth

Video 2

Wrap designs for skin-to-skin care

https://globalhealthmedia.org/videos/wrap-designs-for-skin-to-skin-care/

For a cloth-type binder, additional support from below may be needed to securely hold the newborns and prevent them from slipping, especially when the mother is standing, walking, lying down, or turning in bed. Garments can be worn over the binder and tied from below to provide this extra support. In some sites, these garments have also been customized to secure CPAP tubes using a shoulder loop (Fig. 10).

Fig. 10. A KMC garment worn over a cloth binder

This garment has long flaps that can be tied from below to provide additional support to ensure the newborn does not slip down. It is worn over the binder

Fig. 10. A KMC garment worn over a cloth binder (contd.)

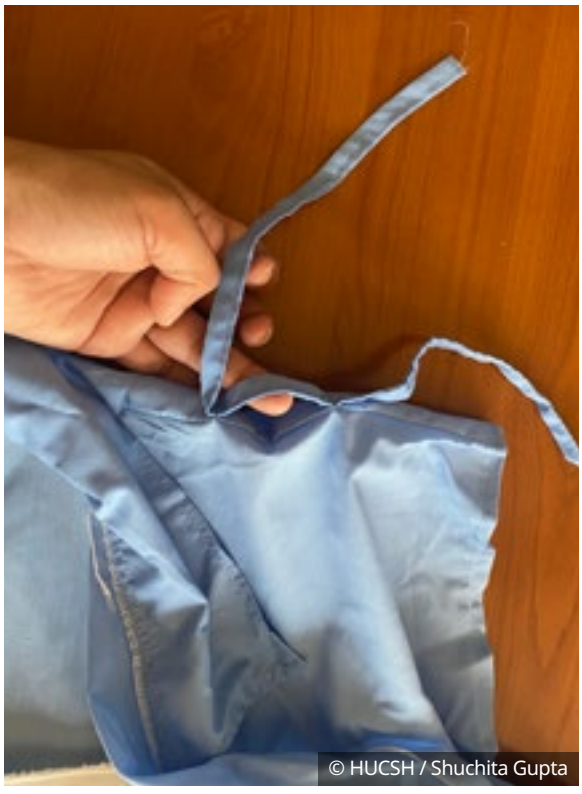

© Bushulo Mother newborn and child health Specialty Center (MNCHSC) / Fitsum Belay


© Bushulo Mother newborn and child health Specialty Center (MNCHSC) / Fitsum Belay


© District Women's Hospital, Ghaziabad / Maya Vinayak Kubal

A KMC garment (green) being tied over the cloth binder (white)


© HUCSH / Shuchita Gupta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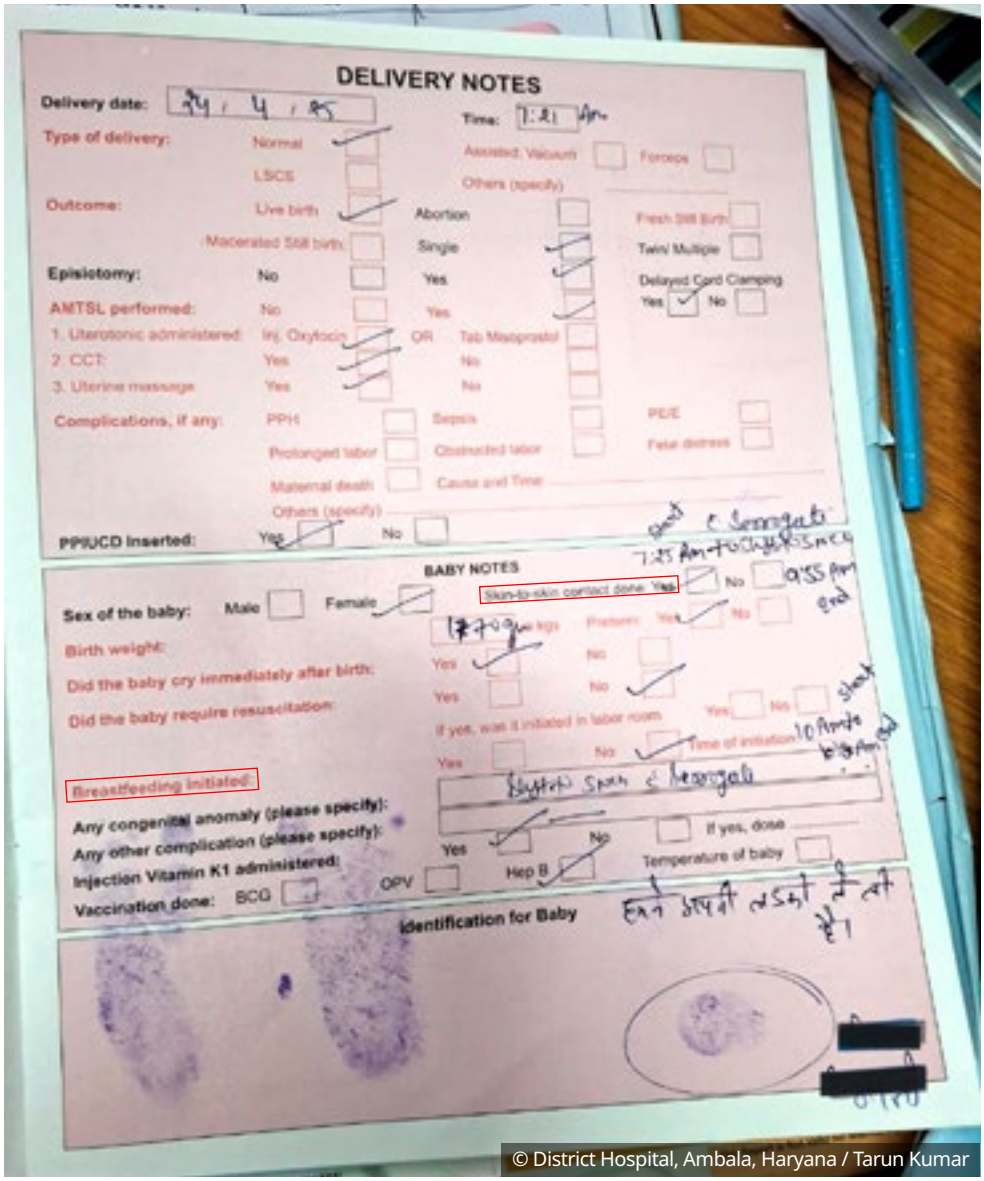
KMC garment with a customized shoulder strap to secure CPAP tubing

Essential medicines and supplies for maternal care, such as oxytocin, adult blood pressure cuffs and a speculum, should also be available in the KMC area and the mother–newborn care unit.

3.4 Health facility records

Monitoring the initiation and duration of skin-to-skin contact and initiation and frequency of breast milk feeding is critical to identify the gaps and ensure optimal implementation of KMC. Health facilities should have mechanisms in place to record the time of initiation of skin-to-skin contact and colostrum or breast milk feeding in childbirth areas, and the daily duration of skin-to-skin contact and details of breast milk feeding in mother–newborn care units and KMC areas (Fig. 11). This can be done by adapting existing registers or creating separate registers. This information should become part of the routine health management information system so it can be reviewed periodically by relevant personnel on a regular, ongoing basis. The information can be used for daily routine care and communication among health workers, for assessment of individual and aggregate patient outcomes, and for quality improvement.

Fig. 11. Labour room register showing initiation and time of skin-to-skin contact and breastfeeding



Labour room register with childbirth notes

3.5 Health workforce

According to revised WHO recommendations, all preterm or LBW newborns now require KMC, whereas prior guidelines included only newborns with a birth weight less than 2000 g. As a result, more newborns will need prolonged care and monitoring for KMC until discharge. Therefore, additional health workers or time may be required to care for mother–newborn dyads in KMC areas, although mothers, with adequate support, will be able to assist with routine care of their newborns. Mother–newborn care units may require extra health workers or health worker time to support mothers with practising KMC for very small or small and sick newborns, along with training in caring for these newborns according to the required level of care. They should also be trained to provide specialized lactation counselling and support to mothers of small and/or sick newborns.

Maternal and newborn health workers need to coordinate their service delivery mechanisms to ensure preterm or LBW newborns and their mothers receive appropriate clinical care, regardless of their location within the facility. This should start from the time the mother is admitted to the health facility for childbirth until discharge, with particular attention paid to the appropriate, coordinated and respectful care of the mother and the newborn in the childbirth area and in the mother–newborn care unit. The mother will require routine postnatal care when she is in the mother–newborn care unit, which necessitates close collaboration between the newborn and maternal care teams. This can be done through maternal care rounds by the gynaecology and obstetrics team in the mother–newborn care unit (joint rounds with the newborn care team are ideal), assigning a nurse or midwife trained in maternal care to the unit, or training the existing mother–newborn care unit staff in routine postnatal care for mothers.

3.6 Costs of care

Uninterrupted implementation of KMC requires ongoing resources, including upkeep of equipment and supplies, educational materials, and regular training and mentoring of staff. Provision of clean drinking-water and food for the mother is essential. These costs should be considered essential and included in routine health facility budgets.

Preterm or LBW newborns require longer hospital stays than healthy term newborns, and subsidizing service fees, where applicable, may be considered. Similarly, many parental leave and social protection programmes do not account for the additional time parents may need to spend in the facility to care for their preterm or LBW newborns, who require extended care and more frequent follow up. Policy support is essential, including the inclusion of care for small and/or sick newborns in health insurance packages and the provision of additional leave and entitlements for parents.

A grandmother takes her turn providing skin-to-skin contact in the KMC position to a newborn receiving CPAP. Note the use of safety pins, as seen in this photo, is not recommended

Section

4

4. Providing KMC in health facilities

4.1 Antenatal preparation and counselling

Ideally, sensitization of the mother and her family should begin during pregnancy, with additional information provided to women at high risk of having a preterm or LBW newborn. This approach allows the woman, her partner and her family to discuss any concerns and seek further information from health workers, as needed.

4.1.1 Breastfeeding counselling

Pregnant women should receive at least one breastfeeding counselling contact before birth *(28,29)*. At a minimum, the antenatal discussion of breastfeeding should include *(30)*:

- the importance of breastfeeding;
- global recommendations on exclusive breastfeeding for the first six months, the risks of giving formula or other breast milk substitutes, and the importance of continuing breastfeeding after six months when other foods are given;
- the importance of immediate and sustained skin-to-skin contact;
- the importance of early initiation of breastfeeding;
- the importance of 'rooming-in' of the mother and newborn;
- the basics of good positioning and attachment;
- recognition of feeding cues.

Antenatal breastfeeding counselling should be tailored to the individual needs of the woman and her family, provided with sensitivity and consideration of their social and cultural context. Women at high risk of delivering preterm or LBW newborns should receive timely counselling from knowledgeable providers as early as possible, to prepare them for the special feeding needs of these newborns *(31)*. All health facilities should have a plan for providing education and counselling on lactation and breastfeeding to pregnant women at risk of having a newborn admitted to the neonatal ward (Box 3). Antenatal consultations regarding the importance of human milk and breastfeeding can be incorporated into general neonatal ward anticipatory guidance and may be conducted by physicians, qualified lactation consultants, midwives or nurses, or other allied health professionals with special expertise in lactation.

All information should be presented in a culturally sensitive manner, considering the mother's literacy level, cultural background, previous breastfeeding experiences and current intention for breastfeeding. Health workers may be afraid to encourage or even discuss breastfeeding to avoid making the mother feel guilty if they do not breastfeed. However, the mother may feel guilty about choosing not to breastfeed if she later discovers that some of the health problems her child faces could have been prevented through breastfeeding. Withholding such information is unethical *(31)*.

Box 3.

Antenatal breastfeeding counselling for women at high risk of delivering preterm or LBW newborns: key components

Antenatal breastfeeding counselling for high-risk women should include all the topics listed in the text plus the following *(31)*:

- Emphasize the importance of prolonged skin-to-skin contact starting soon after birth.
- Provide information on the critical role of early initiation of breastfeeding, including early colostrum expression, especially if the newborn is unable to breastfeed directly, and the benefits of human milk for preterm or sick newborns.
- Offer reassurance that milk production will occur, even after an extremely preterm birth.
- Explain that feeding cues may not be seen immediately in very preterm newborns (gestational age less than 32 weeks), but they will present eventually.
- Teach how to establish and maintain milk supply with hand expression and frequent pumping if breast pumps are available. Emphasize that if donor human milk is available, it is a bridge to the mother's own milk supply and does not replace the need for the mother's milk.

4.1.2 Counselling for prolonged skin-to-skin contact

Antenatal contacts should be used to provide pregnant women, particularly those at risk of having a preterm or LBW newborn, and their partners with information about KMC. Health workers should explain KMC, its benefits for the newborn and the parents, what to expect, how it is done, and the preparations required (Box 4 and Video 3).

Box 4.

Antenatal KMC counselling: key components

- Explain what KMC is, how it is performed, and its numerous short- and long-term benefits.
- Emphasize the importance of starting KMC immediately after birth, the recommended duration of skin-to-skin contact (at least eight hours a day), and the importance of early breastfeeding initiation and frequent breastfeeding.
- Describe the necessary preparations, including practising good hand hygiene, removing any accessories that may interfere with skin-to-skin contact, wearing suitable clothing, and the use of binders.
- Explain what to expect if the newborn or mother requires specialized care.
- Emphasize the importance of keeping the mother and newborn together, even if the mother or newborn requires specialized care, and the need for an additional caregiver to assist the mother if necessary.
- Identify a family member who can support the mother, provide skin-to-skin contact if needed, and ensure continuous care for the newborn during and after the hospital stay.

Video 3

Antenatal counselling for KMC

https://who.canto.global/b/PEOF2

Adopting KMC should be based on an informed decision, and viewed not as an obligation but as the recommended best possible care for the preterm or LBW newborn. A counselling session should provide enough time for the family to address their concerns and questions, allowing them to make a well-informed, shared decision. Using counselling aids can assist health workers in delivering clear and confident counselling. Please refer to the Parent counseling guide on Kangaroo mother care (KMC).

4.2 Starting KMC in birthing areas

4.2.1 Identifying and preparing an additional caregiver

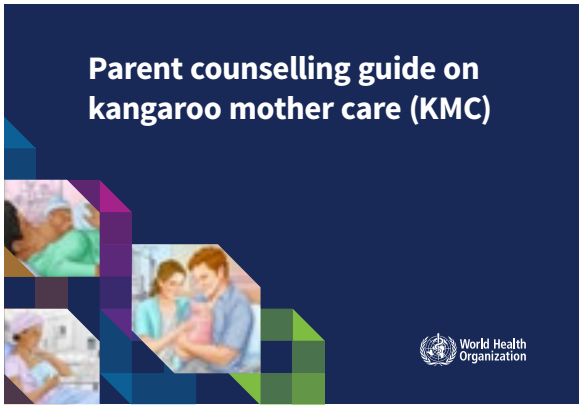
During childbirth, it is recommended that a companion of the woman's choice supports and accompanies her. The companion generally receives an orientation so they can best support the woman. They are best placed to support the mother in starting KMC in the birthing area. If the mother is sick, the companion can serve as an additional caregiver for the newborn and start skin-to-skin contact in the birthing area. If the newborn requires admission to the newborn care unit, the companion can transfer the newborn in skin-to-skin contact. If another family member is available, they can stay with the mother, providing support as she remains under observation in the childbirth area. The KMC process, including how to provide skin-to-skin contact and breastfeeding, should be explained clearly to the mother and her companion in simple terms that they can understand. Demonstrations and support should be provided to ensure correct positioning, with an emphasis on hygiene and handwashing.

4.2.2 Setting up birthing areas for preterm or LBW newborn care

The childbirth area should be clean, well-lit and warm. The windows should be closed to prevent draughts and the temperature should be at least 25 °C *(32)*.[3] There should be handwashing facilities, with soap and water or an alcohol-based cleaner; clean, warm clothes for drying and covering the newborn; and sterile gloves, blades, cord ties, a stopwatch and uterotonic for the mother. KMC binders and garments should be readily available to facilitate the initiation of KMC.

There should be a dedicated area for newborn resuscitation. In primary-level facilities, this can be a warm, dry, flat, safe space for the newborn to receive ventilation,

Parent counseling guide on Kangaroo Mother Care (KMC)



https://iris.who.int/handle/10665/383268

[3] Many operating theatres maintain temperatures below this level, making immediate skin-to-skin contact and covering the newborn with warm cloth essential for keeping newborns warm after a caesarean birth *(33)*.

if required, with a portable lamp to assess the newborn, a disinfected resuscitation kit (self-inflating ventilation bag and masks of appropriate sizes for term and preterm newborns), a suction device and a stethoscope.

In secondary-level facilities and above, the resuscitation area should be equipped with a radiant warmer (prewarmed and ready for use), preterm and term bags and masks, a pulse oximeter, oxygen, and a CPAP machine capable of delivering blended oxygen during stabilization and transport to the newborn care unit (Fig. 12). Advanced resuscitation supplies should be available in units that provide such services.

Appropriate space should be identified in the childbirth areas for the additional caregiver to start skin-to-skin contact if required (Fig. 13). This space can have a wheelchair bed (ideally reclinable) or trolley that can be moved easily to the mother–newborn care unit or KMC area. Additional blankets to cover the mother and the newborn should be available.

Fig. 12. Designated newborn resuscitation area within the childbirth area of a level 2 health facility

Setup of a newborn resuscitation area in a level 2 health facility

Fig. 13. Designated space in the labour room for an additional caregiver to initiate skin-to-skin contact

An additional caregiver initiating skin-to-skin contact in the labor room immediately after birth

The labour/delivery bed should be adequately wide, reclinable and safe, ideally with side-rails or supports, to keep the mother and newborn together in skin-to-skin contact for the first hour after birth. If needed, the mother may also be moved to another suitable bed within the labour room, if one is available. A birth companion or health worker should be available to monitor and support the mother and newborn during the first hour.

4.2.3 Initiating skin-to-skin contact and breast milk feeding in the first hour after birth

Immediately after birth (Fig. 14):

- The newborn should be put in skin-to-skin contact on the mother's abdomen or chest, depending on the length of the cord (Fig. 15). If the cord is short, the newborn can be moved from the mother's abdomen to her chest after the cord has been cut. The initial steps of essential newborn care, including drying, evaluation of breathing, stimulation and clearing of the airway as needed, and delayed cord clamping, occur on the mother's chest or abdomen. The newborn should not be separated from the mother unless resuscitation or ventilatory support is required.
- Continue to assess the newborn's heart rate and breathing (Fig. 16). Listen to the sounds of breathing and look at or feel the movement of the chest. Check the newborn is breathing quietly and easily or crying. Make sure the neck is slightly extended and air can pass freely through the newborn's nose.
- The mother should receive a uterotonic within one minute after birth.

Fig. 14. Algorithm for initiating KMC for a preterm or LBW newborn in the first hour after birth

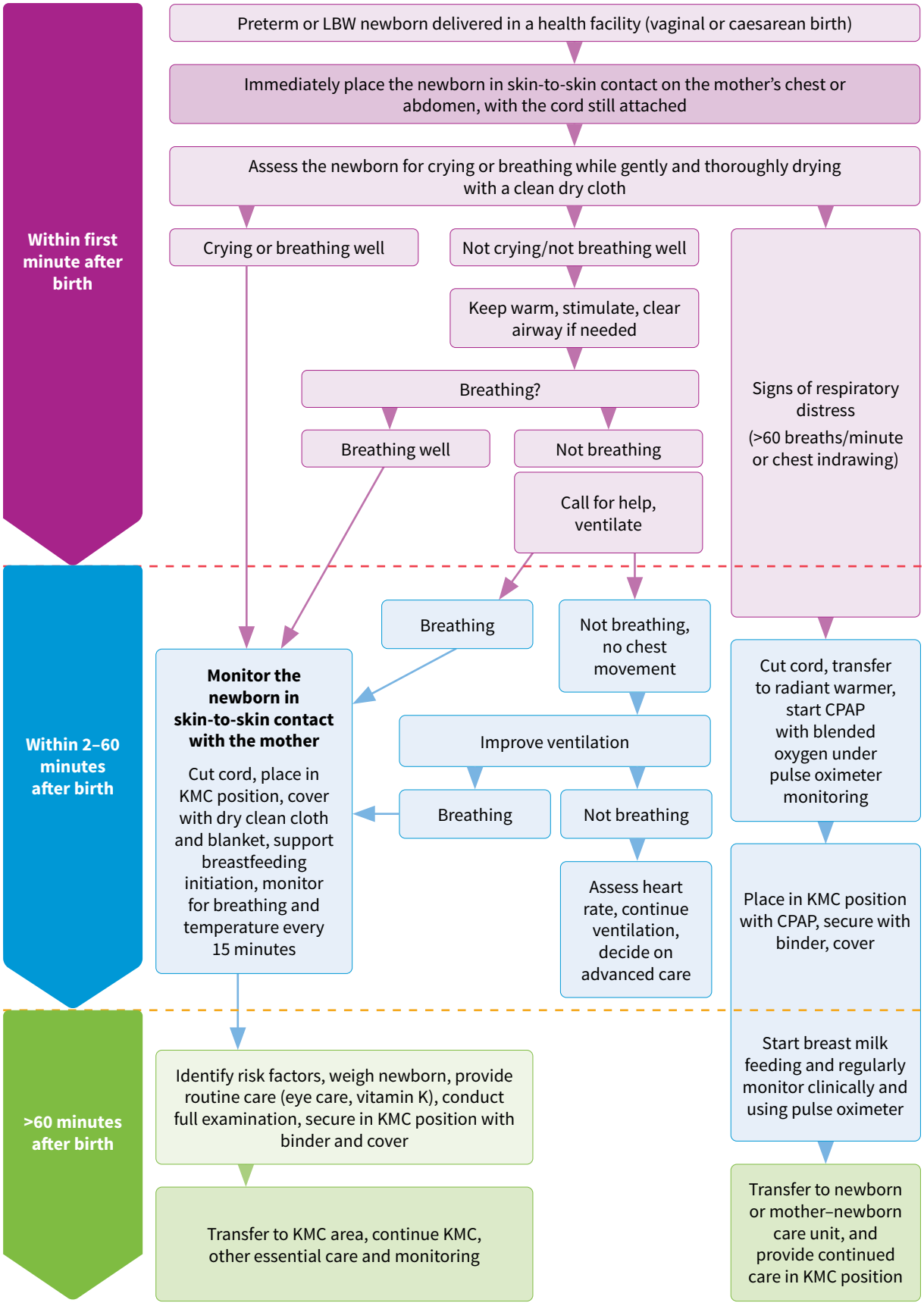


Fig. 15. Immediate skin-to-skin contact: a core component of essential newborn care at birth

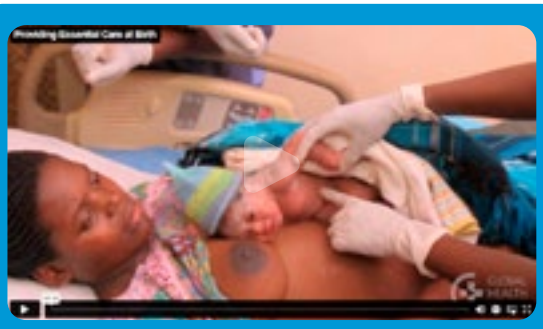
Delayed cord cutting, with the newborn in skin-to-skin contact after birth

Fig. 16. Newborn being examined in skin-to-skin contact with the mother immediately after birth

A doctor examines the newborn in skin-to-skin contact with the mother

Subsequently, within the first hour after birth (Fig. 14 and Video 4):

- Continue skin-to-skin contact without interruption. Cover the newborn's head. Remove any wet cloths and keep the mother and newborn covered with a dry, warm cloth. Postpone bathing and weighing and keep the area warm. Help the mother find a comfortable semi-reclining position, and transfer her from the labour table to another bed if required.
- Monitor the newborn's temperature and breathing every 15 minutes until the first complete examination. Newborns with any signs of respiratory distress, such as fast breathing (i.e. more than 60 breaths/minute), chest indrawing or grunting, require advanced care and continued monitoring. In primary care facilities, newborns need to be transferred to a higher level facility. However, in level 2 facilities and above, CPAP can be initiated on-site in the KMC position.
- Support early initiation of breastfeeding (Fig. 17 and Video 5). Inform the mother and help her recognize signs that the newborn is seeking the breast. After an initial relaxation phase, the newborn will become increasingly active, making mouthing and sucking movements, the rooting reflex becomes more obvious,



Video 4

Providing essential care at birth

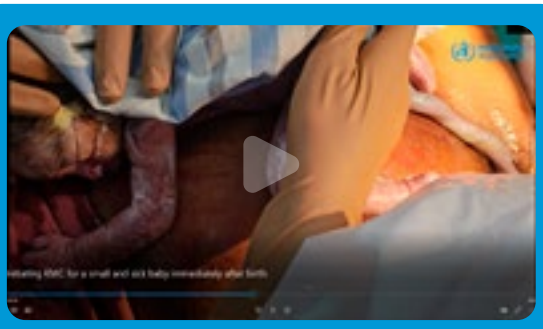
https://globalhealthmedia.org/video/providing-essential-care-at-birth/

Fig. 17. Direct breastfeeding with skin-to-skin contact in the first hour after birth

A health worker supports mother in initiating breastfeeding in the first hour after birth

and exhibiting short bursts of crawling to approach the breast. The newborn can self-attach and begin suckling and swallowing when in skin-to-skin contact with the mother, typically within the first hour after birth.

- Support early lactation and breast milk feeding for newborns who cannot breastfeed directly.
- If the newborn is not able to self-attach, latch or suckle effectively, but is exhibiting breastfeeding reflexes, small amounts of expressed colostrum can be given by spoon, syringe or dropper (Fig. 18). Some extremely preterm newborns may not exhibit breastfeeding reflexes after birth. In these cases, immediate hand expression of maternal colostrum and application to the newborn's oral mucosa using a 1 mL syringe or cotton swab is well tolerated and serves as immunomodulatory therapy *(34)*. Where possible, support the mother to administer her colostrum. For newborns unable to tolerate oral feeding, breast milk should be provided using a feeding tube. Newborns who require respiratory support usually also need nasogastric feeding.
- Any amount of colostrum, no matter how small, should be given to the newborn. If a sufficient amount of the mother's own milk is not available, donor human milk should be provided. Formula milk should only be considered when the mother's own milk and donor human milk are not available. The mother should be encouraged to express her milk frequently (a minimum of 8 times and up to 12 times in 24 hours) to help establish and maintain milk production. The newborn can remain in skin-to-skin contact with the mother during breast milk expression to promote bonding and breastfeeding success.
- Frequent breast milk expression starting soon after birth (ideally within the first one to three hours) is important even when the additional caregiver is providing skin-to-skin contact for the newborn *(31)*.
- Provide essential care for the mother in the first hour after birth. Monitor her condition every 15 minutes. Key assessments of the mother include:



Video 5

Initiating KMC for a small sick newborn immediately after birth

https://who.canto.global/b/I8J7J

  - monitoring vital signs, such as measure blood pressure, pulse rate, respiratory rate and temperature;
  - assessing uterine tone (through palpation) to confirm it is well contracted and to promptly identify any signs of uterine atony;
  - measuring and recording blood loss from vaginal bleeding.
- If emergency signs are present, the mother should be assessed and managed according to health facility protocols. Health workers must respond immediately to any abnormal findings. Additionally:
  - encourage the mother is comfortable, through a semi-reclining or sitting position;
  - advise the mother to empty her bladder and ensure she has passed urine;
  - encourage the mother to eat, drink and rest;
  - ask the mother's companion to watch her for any increased bleeding or pain, dizziness, severe headache, visual disturbance or epigastric distress, and to call for help if necessary;
  - review the mother's clinical record and administer any due treatments or prophylaxis;
  - provide advice on postpartum care, nutrition and hygiene;
  - assist with early colostrum expression and early initiation of breastfeeding (as described).

Fig. 18. Expressed breast milk feeding in the first hour after birth for very small and sick newborns

Colostrum being collected in a syringe while the newborn is on CPAP in skin-to-skin contact with the mother

Mother observing her newborn being fed colostrum

Note continuous monitoring of the newborn by pulse oximeter

A mother provides tube feeding to her newborn in KMC position

4.2.4 Considerations for caesarean births

For caesarean births, placing the newborn directly on the mother's abdomen or chest may not be feasible due to drapes covering the mother's abdominal area or separating her chest and abdomen. In this case, the newborn should be placed on the mother's thighs for the first one to three minutes, where initial steps of essential newborn care (i.e. drying, assessment of breathing, stimulation and clearing of the airway if needed) can be performed. After delayed cord clamping and cutting, the newborn is handed to another health worker, who then places the newborn in skin-to-skin contact on the mother's chest.

The newborn is usually placed transversely on the mother's chest, with their head turned towards the mother and their body and back of head turned towards the mother's abdomen (Fig. 19). The newborn should be covered with a dry cloth and a warm blanket. A designated health worker should assess and care for the newborn during skin-to-skin contact with the mother to ensure safety. If the mother is awake and cooperative, all essential care, including initiating suckling or colostrum feeding, can be performed while the newborn is in skin-to-skin contact on the mother's chest on the operating table (Fig. 20).

The obstetric team may monitor the mother in the postoperative recovery room for several hours after a caesarean birth before transferring her to the mother–newborn care unit or the KMC ward. During this time, the mother can maintain skin-to-skin contact with her newborn, secured on her chest in the KMC position using a binder, if she feels comfortable. If not, the additional caregiver can keep the newborn in skin-to-skin contact, in the same room as the mother, until the mother is confident and comfortable. It is crucial to assist the mother with early colostrum expression during this period, if she is not able to breastfeed directly. Skin-to-skin contact should continue once the mother starts ambulating, after the anaesthetic effects have worn off. She should be accompanied for safety until she is able to walk independently.

If the mother is under general anaesthesia, sedated or medically unstable, skin-to-skin contact should be initiated with the help of an additional caregiver in the operating room or an adjacent area where appropriate newborn care can be provided. Alternatively, the newborn can be placed in skin-to-skin contact with the mother and monitored and cared for by a health worker or additional caregiver, with the mother's prior consent. Skin-to-skin contact can begin once the mother is stable, responsive and alert, and able to engage with the newborn, although this may be delayed, depending on the mother's condition. Early assistance with colostrum expression is crucial. Health workers in the recovery area should support the mother with colostrum expression as soon as possible and ensure it is given promptly to the newborn.

Fig. 19. Newborn in skin-to-skin contact with the mother immediately after caesarean birth

A newborn placed transversely in skin-to-skin contact on the mother's chest immediately after caesarean birth

Fig. 20. A newborn being supported to suckle at the breast immediately after caesarean birth

Newborn on minimal respiratory support; note continuous monitoring by pulse oximeter

Newborn on CPAP

4.2.5 Considerations for multiple births

Newborns delivered as multiple births should be put in skin-to-skin contact with the mother immediately after birth, like all other preterm or LBW newborns (Figs. 21–23). The mother can care for twins by placing one newborn on each side of her chest. A safe position ensuring a patent airway can be maintained with twins and even triplets. The mother should alternate the newborns' positions at different times to vary the alignment of each newborn's head and neck. Both newborns can be breastfed together while in skin-to-skin contact, although initially the mother may want to breastfeed one newborn at a time, which is also acceptable.

Triplets and higher-order multiple births present practical challenges for implementing KMC. Extra care and effort should be taken to find additional caregivers for these newborns, ideally before birth.

Fig. 21. Twins in skin-to-skin contact with the mother immediately following caesarean birth

Twins in SSC together. Each newborn is placed on a different side of the mother's chest

Fig. 22. Twins directly breastfeeding together in KMC position

A mother breastfeeding twins together in the KMC position

Fig. 23. Simultaneous skin-to-skin contact with triplets

A father providing skin-to-skin contact to triplets

4.2.6 Transferring the mother–newborn dyad in the KMC position

Before transferring the mother-newborn dyad from the childbirth areas after the first hour following birth, review the pregnancy, labour, birth, and the first hour for any risk factors affecting the newborn's care. A complete physical examination should be conducted, including checking birth weight (ideally with a digital scale) and gestational age to identify newborns who may need special care. The best-estimated gestational age should be documented, ideally based on early antenatal ultrasound from the first trimester. Perform other routine procedures such as eye care, cord care, vitamin K administration and transfer the mother–newborn dyad to the appropriate newborn care area.

The newborn should be secured in the KMC position using a binder and transferred to the newborn or mother–newborn care unit or the KMC area, depending on the gestational age and birth weight, risk assessment and clinical condition.

Small and/or sick newborns can be safely transferred in skin-to-skin contact with the mother or additional caregiver, with proper planning and preparation. Transfers should be done gently and calmly to avoid stress and sensory overload for the newborn.

In the first hour, the newborn lies contained but not secured on the mother's or additional caregiver's chest. A diaper is placed before transport, if it has not been put on before. The newborn is then secured in the KMC position using a binder and additional support if required, such as KMC garments to maintain the proper neck position and airway patency during transport, and minimizing the risk of a fall. A pulse oximeter probe should be attached to continuously monitor the newborn's heart rate and oxygen saturation. For transport within a facility (e.g. from the childbirth area to the mother–newborn care unit or KMC area), it is preferable for the mother–newborn dyad to be transferred together in a wheelchair, movable bed or trolley for safety and supervision (Fig. 24). Although the additional caregiver may walk with the newborn secured in the KMC

position, using a wheelchair, movable bed or trolley is preferred for enhanced safety.

It is desirable to have a dedicated customized wheelchair or trolley to securely carry monitors and any newborn care equipment and supplies to minimize the risk of injury to the newborn, parents or health workers (Fig. 24). This is particularly important when transferring very preterm, very LBW or sick newborns who require continuous care such as non-invasive ventilatory support during transport to the newborn or mother–newborn care unit. Additional clothing or blankets may be required to cover the newborn and the mother or additional caregiver to keep them warm during transport.

Fig. 24. Inter-facility transfer of a newborn from childbirth to newborn care areas in KMC position

Mother–newborn dyad being transferred on a movable bed with side railings, note continuous monitoring by pulse oximeter

Newborn being transferred in skin-to-skin contact with an additional caregiver seated in a wheelchair adapted to support all necessary equipment

Transfer of a newborn in skin-to-skin contact with additional caregiver in a wheelchair with a customized trolley to carry all required equipment

Very preterm newborns, especially those with clinical signs of respiratory distress, may require CPAP to be started in the birthing area. When transporting preterm newborns on CPAP, ensure they are transferred with adequate pressure and fraction of inspired oxygen (FiO_2) settings to maintain oxygen saturation in the desired range. The transport bed or trolley should accommodate the necessary equipment and the pulse oximeter.

Health facilities caring for women with high-risk pregnancies should ideally have mobile CPAP equipment for ongoing use during transfer. Portable CPAP devices are available that can be used for intra- and interfacility transport. In low-resource settings, bubble CPAP devices that can provide blended oxygen using a Venturi blender or other low-cost air–oxygen blender, without the need for compressed air and electricity, can be used to transport the newborn on CPAP. Some of these are already in use in few resource-constrained settings *(35,36)* while others are in development *(37,38)*. A T-piece resuscitator adapted to provide positive end-expiratory pressure can also be used with a nasal mask or cannula using blended oxygen *(39)*.

Routine use of 100% oxygen increases the risk of lung and eye damage and should be avoided. Safe use of high oxygen concentrations in preterm and LBW newborns requires continuous monitoring using pulse oximetry, and is best avoided outside neonatal intensive care unit settings. In resource-limited areas, a low-cost oxygen blender can mix oxygen and air to safely transport the newborn in skin-to-skin contact with the mother or additional caregiver.

In emergency situations where the newborn requires urgent intensive care, immediate transfer may be necessary. The newborn can be moved using a radiant warmer or transport incubator as quickly as possible, even without a parent if necessary. Poorly managed transfers can significantly increase the risk of morbidity and mortality. Health facilities caring for women with high-risk pregnancies must proactively plan for emergency transfers. Advance preparation with skilled teams and clear protocols is

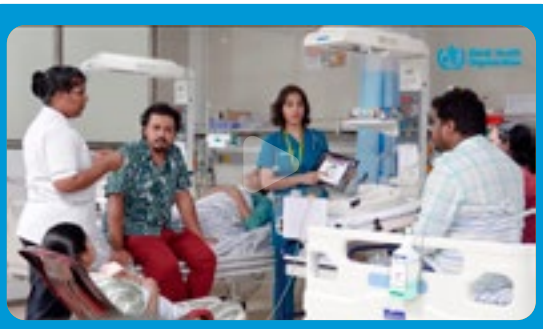
crucial to ensure the newborn receives the necessary care while minimizing transfer risks. Protocols should be based on available personnel and equipment. All health workers in childbirth areas must be trained in these processes. The same considerations apply to interfacility transfer of the mother–newborn dyad.

4.3 Continuing KMC in the health facility

4.3.1 Postnatal counselling and education on KMC

Once the newborn is transferred with the mother or additional caregiver to the newborn or mother–newborn care unit or the KMC area, a detailed counselling session is required to prepare the mother and/or additional caregiver for the process of providing prolonged KMC while in hospital (Video 6). They are in a new setting, and they may only be starting to realize what it takes to stay in a hospital, interact with health workers and care for a newborn. Helping them understand what to expect, what they need to do, and what support they have will empower them to ask questions and decide what to do to ensure optimal care for themselves and their newborn.

Postnatal counselling is vital for the success of KMC, even if the family has received antenatal counselling. For families with preterm or LBW newborns – or those who did not receive antenatal counselling – postnatal support becomes even more essential.



Video 6

Postnatal counselling on KMC

https://who.canto.global/b/G04P0

Counselling can take place in any setting where the mother and newborn are cared for, such as a newborn or mother–newborn care unit if the newborn needs specialized or intensive care, or in a KMC area if the newborn is stable. It is important to explain that although KMC should ideally be provided by the mother, the father or another family member can also keep the newborn in skin-to-skin contact and feed them expressed breast milk if the mother is not available or needs a rest/break. Highlight the benefits of KMC for the newborn, the mother and the family.

Box 5 outlines a structured approach that can be considered for effective counselling, while Box 6 provides some pointers regarding postnatal counselling for KMC. The use of a flipchart or audiovisual materials can support health workers in providing effective counselling. Please refer to the previous counseling guide.

Box 5.

Counselling the mother for KMC

Use the format of greet, ask, listen, praise, advise and confirm understanding:

- **Greet:**
  - Build rapport – introduce yourself, and ask the names of all family members present.
  - Be attentive – sit facing the mother using an open posture, lean forward, and maintain eye contact to show engagement.
- **Ask open-ended questions** – "How are you feeling today?", "How do you think your baby is doing?"
- L**isten and observe:**
  - Listen carefully to what the mother says – "My baby is so sick that he needs a machine to help with breathing. I wonder if it is safe to hold him?"
    - Paraphrase and clarify – "You said your baby is sick and requires respiratory support, and you are unsure if it is safe to hold him."
    - Reflect the mother's feeling – "It seems like you are worried about your baby's condition – am I right?"
- **Praise** – "It is okay to feel scared. It is good that you are here and willing to provide KMC to your baby."
- **Advise** – Explain and answer questions – what is KMC, what are its benefits, how is it done, and what is the end goal?
- **Confirm understanding and summarize next steps** – "Can you repeat what we discussed today to ensure I have explained everything clearly?"

A doctor guides a mother to do proper Kangaroo Mother Care positioning in Da Nang Hospital for Women and Children.

Box 6.

Postnatal KMC information and discussion: key components

- Re-emphasize the benefits of KMC, that it can be done by the mother or additional caregiver, and the importance of family support for prolonged skin-to-skin contact.
- Demonstrate correct KMC positioning, including the use of binders and garments. Allow the mother to practise in a safe environment, ensuring she is confident in how to place and remove the newborn from the KMC position and who to contact for help if needed. Each session should last at least one hour. Encourage the mother to breastfeed the newborn every two to three hours and remind her to move periodically to ensure comfort and promote adequate blood circulation, particularly in her legs.
- Re-emphasize the importance of giving colostrum or breast milk. Explain that breast milk produced by the mother of a preterm newborn is high in protein and fat, contains antibodies to prevent and fight infection, and contains other components that the newborn needs to support healthy growth and development. No other milk can replace it. Demonstrate breastfeeding in the KMC position and milk expression by hand or breast pump, if needed.
- Emphasize hygiene and involve the mother in daily care tasks such as diaper changes and feeding.
- If the newborn is in the intensive care unit, address concerns about machines and monitors. Teach the mother to recognize warning signs and alert staff when needed.
- Counsel the mother daily, guiding her on how to track the duration of skin-to-skin contact and breastfeeding frequency. Encourage support from other mothers and emphasize the importance of continuing KMC at home. Give space for the family to express any concerns and offer the necessary guidance and support.
- Emphasize the need for regular follow-up to monitor the newborn's growth and health.

4.3.2 Helping a mother place the newborn in the KMC position

The first session is important and requires time and undivided attention. Use a dedicated space inside the KMC room or mother–newborn care unit, warm enough for the newborn and free from draughts. Encourage the mother to invite her partner or a companion of her choice to attend the session for support and reassurance. This will also help prepare them to serve as an additional caregiver, providing skin-to-skin contact when the mother is resting or needs to do other activities such as bathing. Review and build on the mother's or additional caregiver's prior experience of KMC and re-emphasize the importance of prolonged skin-to-skin contact and frequent and exclusive breastfeeding.

For a preterm or LBW newborn who is otherwise well and stable, one health worker can place the newborn in the KMC position. With help, feedback and practice, the mother will soon be able to do this herself. Before moving the newborn, describe to the mother or additional caregiver each step of getting the newborn into the KMC position, explaining its importance and purpose. The process is described in full in Table 3 and Video 7.

Video 7

Placing a stable newborn in the KMC position

https://who.canto.global/b/ORVHS

Table 3. Step-by-step guide for placing a stable newborn in the KMC position

Step	Description
Step 1: hand hygiene  © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi A health worker and a mother handwashing outside the Mother–Newborn Care Unit	Health worker and the mother should perform appropriate hand hygiene to prevent infection
Step 2: prepare the mother  © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi Mother sitting upright on a recliner bed in the mother–newborn care unit, wearing a front-opening top *Note:* The untied binder is worn underneath in preparation for KMC, allowing for easier adjustment once the newborn is placed in position. The mother will be wearing a KMC garment in place of the checkered shirt shown in this photo.	The mother can sit upright or semi-reclining on a chair or bed The mother should wear front-opening clothes, with no inner wear (e.g. bra or vest): • If using a non-elastic cloth binder, the mother should place it around her chest and wear a KMC garment over the binder

Step	Description
 Health worker showing the placement of a tube top like binder over which KMC garment is worn. *Note:* The mother would not be wearing the blue colored dress shown in the photo.	• If using a stretchy tube-top like elastic binder, the mother should roll it down below the breasts. She can wear a front-opening top/garment over the binder
Step 3: prepare the newborn  Newborn wearing a cap and diaper, with a pulse oximeter cable attached to the foot, ready to be placed in the KMC position	Cover the newborn's head with a cap and put on a dry diaper Attach the pulse oximeter probe to the newborn's hand or foot If the newborn is stable, the probe can be detached temporarily from the base unit during transition
Step 4: move the newborn  Newborn being gently moved in a supine position, with a health worker supporting the head and neck slightly extended and legs in a flexed position	The newborn can be moved in the prone or supine position: • Supine position: hold the newborn supine, supporting the head and neck with one hand, and lightly supporting the jaw to avoid flexion or hyperextension of the neck; use the other hand to support the newborn's buttocks

Step	Description
 Newborn being moved in a prone position  An alternative way to support a newborn's head and neck in the prone position *Note:* The index and middle fingers gently support the jaw and sides of the face, while the thumb and remaining fingers cradle the head and neck to ensure slight extension and stability.	• Prone position: one health worker turns the newborn prone on to their open palm and forearm, with their palm under the newborn's chest and abdomen and index finger supporting the newborn's chin to hold the neck in a semi-extended position to keep the airway optimally open; their forearm supports the rest of the newborn's body, and their second hand keeps the newborn's hips and legs in a flexed position

Step 5: place the newborn on the mother's chest and ensure the correct KMC position

Newborn being placed on the mother's chest

Place the newborn prone, with the head high on the mother's chest, between her breasts, in direct skin contact, and the newborn's head turned to one side

The mother should support the newborn's neck with one hand and the buttocks with the other

Keep the newborn's head in a slightly extended position to maintain airway patency

Avoid flexion and hyperextension of the newborn's neck

The newborn's arms should be flexed, and the hand on the side of the face should be close to the newborn's mouth

The newborn's hips and knees should be flexed, and the hips partially abducted

See Fig.25

Step	Description
 © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi The mother supports the newborn by gently holding the head and neck with one hand and the buttocks with the other *Note:* The newborn's neck is slightly extended, arms are flexed, and the legs are flexed at hips and knees with slight abduction at the hips. The newborn is positioned high enough on the chest for the mother to kiss the head.	The mother should be able to kiss the newborn's head The direction of the newborn's head should be changed at each session, or every one to two hours when sessions last longer
Step 6: secure the newborn in the KMC position using the binder	
 © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi Newborn being secured in the KMC position using a cloth binder, with the knot tied at the side of the mother's body	Secure the newborn with a binder that ensures a patent airway[a] The binder should wrap around the mother's back, high under the axillae, and cross above the breasts, avoiding compression, and the top of the binder below the newborn's ear If using a cloth binder, tie it firmly enough to prevent the newborn from sliding out when the mother stands. Ensure the tight part is over the newborn's upper back, and the newborn's abdomen is positioned at the level of the mother's epigastrium to allow the newborn enough room for abdominal breathing. The knots should be on the side and easy for the mother to tie and untie

[a] When used as the sole means of support, the binder should also support the newborn's weight when the mother or additional caregiver is standing to prevent shifting or falling from the chest with lateral movement of the mother or additional caregiver.

Step	Description
 Newborn being secured in the KMC position using a tube type elastic binder, which is pulled up over the newborn's body after placing him in position	If using a stretchy elastic tube binder, roll it up to the mother's chest, place the newborn in the correct position, and secure the binder. Reassemble as needed for proper positioning If the newborn is restless, allow wriggling movements to settle, before securing the binder
Step 7: check and secure all cables and tubes connected to the newborn, and check clinical condition	
 Newborn in the KMC position with a securely placed RAM cannula after repositioning	Any attached cables (e.g. pulse oximeter) or tubes (e.g. intravenous line) should be secured by taping or clipping them on to the mother's garment or skin (when taped on to skin, the mother can feel any tension immediately) Stay with the mother and newborn and check the newborn's clinical condition and mother's comfort
 Mother adjusts the pulse oximeter on the newborn's foot after securing the KMC binder	

Step	Description
Step 8: Secure the newborn further in position using a KMC garment worn over the binder and tied from below.	
 © Picturing Health / Tom Gibb A KMC garment is worn over the cloth binder and tied from below to provide extra support and prevent the newborn from slipping	It is important to use a KMC garment that can be tied from below as additional support when using a cloth binder The mother can wear her normal top clothing when using a stretchy elastic binder because the binder provides more support In cold environments, cover with a blanket; in hot environments, no extra clothing is required Let the mother and newborn settle under supervision
 © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi A double knot on the side allows the mother to easily reach and untie the KMC garment when needed	
Step 9: educate and counsel mother	
 © Picturing Health / Tom Gibb A health worker demonstrates to the mother how to monitor the newborn's oxygen saturation using a pulse oximeter	Explain to the mother how to observe and care for her newborn while providing KMC Encourage the mother to move around while ensuring the newborn stays secure

Step	Description
 The mother walks while holding her newborn securely in the KMC position	

In the KMC position, the preterm or LBW newborn lies in direct skin-to-skin contact on the chest of the mother or additional caregiver, between the breasts, in a prone and vertical position (Fig. 25). The newborn's head is turned to one side (with the position alternating at each sitting), with the neck slightly extended to ensure a clear airway. The arms, hips and knees are flexed, and the hips are partially abducted.

Fig. 25. The KMC position

Correct KMC position, showing the newborn placed prone in skin-to-skin contact on the mother's chest.

Note: In the KMC postion, the preterm or LBW newborn lies in direct skin-to-skin contact on the chest of the mother or additional caregiver. The newborn's neck is slightly extended, arms are flexed, and the legs are flexed at hips and knees with slight abduction at the hips. The newborn is positioned high enough on the chest for the mother to kiss the head.

For very small or sick newborns, especially those on respiratory support, at least two health workers are needed to place the newborn in the KMC position. The step-by-step process is described in Table 4. Education, training and practice for the medical team are essential. The mother or additional caregiver should be informed about the move, and step-by-step process explained, depending on the level of medical support the newborn is receiving. The change of the newborn's position should be slow and not abrupt. A health worker trained in neonatal life support should be available in case advanced airway support is necessary. The resuscitation equipment should be checked before moving the baby and be readily available during the process (Video 9).

Table 4. Step-by-step guide for placing a newborn on CPAP or other non-invasive support in KMC position

Step	Description
Step 1: hand hygiene  © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi Two health workers counsel the mother on the steps for moving a newborn on CPAP into the KMC position  © St John's Medical College Bangalore / Lakshmi Parvathi Badlamundi Performing hand hygiene before handling the newborn to prevent infection	At least two health workers are needed to move a preterm or LBW newborn on CPAP Both the health workers and the mother should perform appropriate hand hygiene

Step	Description
Step 2: prepare the mother	
 Mother sitting in a reclined position on the bed, wearing a KMC garment near the CPAP machine	The mother can sit upright or a in semi-reclined position on a chair or bed, although it may be easier to start with the mother in a semi-reclined position[a] Ensure the mother is close enough to all the equipment, and tubes and lines are long enough The mother should wear front-opening clothes, without any inner wear (e.g. bra or vest)
Step 3: prepare the newborn	
 Newborn on CPAP lying in a radiant warmer under continuous monitoring by a pulse oximeter	The newborn should be calm, relaxed and breathing easily on current respiratory support settings Dress the newborn in a cap and a dry diaper Attach the pulse oximeter probe to the newborn's hand or foot
Step 4: move the newborn	
 Moving the newborn in a supine position	The newborn can be moved in a supine or prone position: Supine: one health worker supports the newborn's head, neck, arms and hands with one hand, and uses their other hand to support the newborn's legs in a flexed position Prone position: same as described earlier (see table 3)

[a] In some units (e.g. in Stockholm, Sweden), the mother or additional caregiver stands up and leans forward to take the newborn, but this should be done only in very experienced settings.

Step	Description
 One health worker holds the newborn while another holds the CPAP tubing and monitors vitals	The second health worker holds the CPAP tubing to ensure the nasal interface and inspiratory and expiratory tubes remain in place. If the newborn requires intravenous lines or additional tubes, a third person may be required to hold these during the move. The newborn is moved laterally towards the mother with slow and controlled movements.
Step 5: place the newborn on the mother's chest and ensure the correct KMC position	
 The newborn's position is adjusted after being placed on the mother's chest	Once close to the mother, the newborn is carefully placed prone on the mother's chest The mother places her hands over the health worker's hands to ensure the newborn remains in place before the health worker gently removes their hands The second health worker keeps holding the CPAP tubes so as not to disturb the nasal interface and continuously monitors the newborn's oxygen saturation Once the newborn is on the mother's chest, check the position is correct and assess the newborn's clinical condition Check all the attached tubes and cables are in place and functioning.

Step	Description
Step 6: secure the newborn in the KMC position using the binder and the KMC garment for additional support	

Newborn being secured in the KMC position using a binder

Additional support is provided by fastening a KMC garment over the binder

Same as for stable newborn (see table 3)

If using a cloth binder, provide additional support from below using the KMC garment so the newborn does not slip

If using a stretchy elastic binder, the mother can wear her routine top-wear, but pay particular attention to the positioning of the newborn's neck to maintain a secure airway

When using a tube-shaped stretchy elastic binder, ensure the cables run from the top for easy access in emergencies, allowing quick removal of the binder if needed

Step	Description
Step 7: check and secure all cables and tubes connected to the newborn, and check the newborn's clinical condition	
  CPAP tubes are secured to the KMC garment to avoid displacement	Secure all cables, leads and tubes by taping on to the mother's garments or skin Stay with the mother and newborn and check the newborn's clinical condition and mother's comfort
Step 8: cover the newborn and mother, and let them settle and observe for some time until mother feels comfortable	
 Mother and newborn settle down in KMC position with all the tubes and connections secured	If the environment is cold, cover the mother and newborn with a blanket; if the environment is hot, no extra clothing is required Let the mother and newborn settle under supervision

Step	Description
Step 9: educate and counsel the mother  Health worker educating the mother on what to monitor  The mother observes her newborn in the KMC position using a mirror	Explain to the mother how to observe the newborn, what signs to watch for, and when to call for help

Video 8

Placing a sick newborn on CPAP in KMC position

https://who.canto.global/b/HNMAD

After positioning and securing the newborn on the mother, let them rest. Stay with them and check the newborn's position and clinical condition. Monitor the newborn's vital signs continuously and the mother's state of comfort. Explain to the mother how to observe the newborn and what to look for, including how to observe activity, breathing, colour and temperature. Units that practise KMC for extremely preterm newborns may also provide a mirror for the mother to observe the newborn.

4.3.3 Maintaining prolonged skin-to-skin contact

Once KMC is initiated, the mother or additional caregiver should aim to provide as close to 24 hours of skin-to-skin contact per day as possible, with a minimum of at least eight hours per day. When the mother needs a break to attend to her daily activities, the additional caregiver can provide skin-to-skin contact during these times. Each KMC session should last at least one hour to avoid unnecessary stress for the newborn and allow for normal sleep cycles and temperature regulation. When the mother needs to be away from her newborn and no additional caregiver is available to provide skin-to-skin contact, the newborn should be placed in a warm cot, away from draughts and covered by a warm blanket, or be placed under an appropriate warming device such as a radiant warmer or incubator using the same moving techniques as described for KMC positioning.

Boredom may be a challenge for some mothers or additional caregivers. To address this, engaging activities and structured educational sessions to keep them informed and motivated can be organized. Explain that prolonged KMC can facilitate early discharge. Peer group support can be highly effective in enhancing adherence and fostering a sense of community. When the newborn is awake, the parents should be encouraged to give their full attention to the newborn, promoting active engagement. Parents can be encouraged to sing, talk and read books to the newborn.

4.3.4 Mother's movement and sleep

A mother carrying her newborn in the KMC position can go about her day as she wishes. She can walk, stand, sit or engage in activities such as recreational or educational tasks if the newborn is not on intravenous fluids or respiratory support. When possible, encourage the mother to move around during KMC sessions to reduce boredom and promote blood circulation. If the newborn is attached to therapeutic or monitoring lines in a newborn care unit, the mother can still move her feet and legs while seated.

The mother can sleep while practising KMC, but she should avoid completely flat or horizontal positions. A semi-recumbent position, at about 20–30 degrees from the horizontal, is ideal for comfort and safety. This can be achieved by using an adjustable bed, or by using several pillows on a regular bed. Reclining KMC chairs that offer full body support may be useful. The semi-recumbent position may feel uncomfortable initially, but most mothers adapt to it quickly. A comfortable reclining chair can provide good support for daytime rest.

4.3.5 Monitoring the newborn in the KMC position

Close monitoring of the newborn in the KMC position is required, especially if the newborn requires level 2 (special) or level 3 (intensive) care. Clinical parameters such as heart rate, respiratory rate, temperature, oxygen saturation, activity and feeding should be checked at least every six hours, irrespective of the place of care. Refer to the video on newborn examination in KMC position (Fig. 26). Very small or small and sick newborns may need more frequent monitoring, including glucose monitoring. The mother or additional caregiver should be engaged in monitoring the newborn.

Temperature

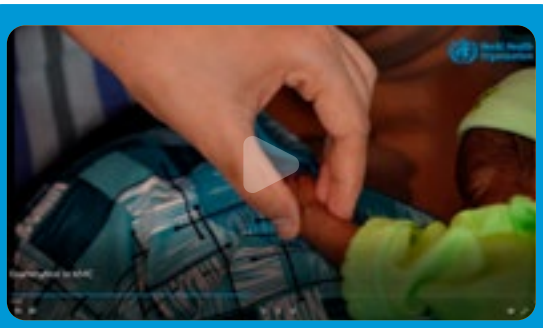
Mother–newborn care units and KMC areas should maintain a room temperature of at least 25 °C *(32)*. Although rare in newborns in the KMC position, hypothermia can occur, especially if the newborn has an infection or has prolonged contact with a wet diaper or clothing. The newborn's axillary temperature and other vital signs should be monitored at least every six hours. Temperature monitoring should continue at this frequency until stable readings are documented for three consecutive days (Box 7), and then measured twice a day. The mother can be taught to check the newborn's extremities to assess whether they are warm.

Fig. 26. Newborn examination in KMC position

A health worker examines a newborn receiving KMC in the KMC position at a mother–newborn care unit

Measuring axillary temperature in newborns in KMC position

- Keep the newborn warm throughout the procedure in skin-to-skin contact with the mother and properly covered. Open or loosen the binder and expose only one arm.
- Clean the thermometer and place the thermometer bulb high up in the middle of the axilla. The skin of the axilla must be in full contact with the bulb of the thermometer, with no air pockets between the skin and the bulb.
- Hold the newborn's arm against the side of their chest gently. Keep the thermometer in place for at least three minutes for a mercury thermometer or until a digital thermometer beeps.
- Remove the thermometer and read the temperature. Place the arm back in KMC position, secure the binder, and record the temperature in the newborn's case record.



Video 9

Newborn examination in KMC position

https://who.canto.global/b/R4DO3

Breathing

Preterm or LBW newborns may exhibit periodic breathing, where normal breathing alternates with a few faster breaths and brief pauses. This is normal, reflects immature respiratory control, and does not require treatment. Preterm and LBW newborns may

Box 7.

Management strategy for managing low body temperature in KMC

If the newborn's body temperature falls below 36.5 °C during skin-to-skin contact, do the following:

- Remove any wet clothes, change the diaper if required, and put on a cap, if not worn before.
- Cover the mother and newborn with extra blankets.
- Improve the thermal environment of the room by raising the temperature, reducing movement of air, and removing or covering cold surfaces.
- Minimize interruptions in skin-to-skin contact.
- Measure the newborn's temperature an hour later. If uninterrupted skin-to-skin contact is not possible or the newborn cannot maintain a normal temperature in sustained skin-to-skin contact, consider using an alternative method of warming such as a radiant warmer, incubator, heated cot or heat-producing wrap. **Only trained providers should use alternative warming devices. Overheating a newborn can cause death, dehydration, apnoea or brain injury.**
- Look for possible causes of hypothermia, such as low room temperature, air draughts or use of a fan, not being in the KMC position before measuring the temperature, being bathed, not feeding well, serious infection or hypoglycaemia. If no obvious cause can be found and the newborn continues to have difficulty in maintaining a normal body temperature, assess the newborn for possible bacterial infection.

Hypothermia should be managed using standard guidelines for care of small and/or sick newborns.

also experience apnoea, however, which is a cessation of breathing lasting for 20 seconds or longer, or for a shorter duration but accompanied by bradycardia (heart rate below 100 beats per minute), pallor, cyanosis, or oxygen saturation levels below 85%. All neonates born before gestational age 35 weeks should be monitored during the first week of life. Always react immediately to a mother's and/or additional caregiver's call for help.

Immediate interventions for apnoea include:

- correcting the newborn's neck position;
- suctioning and clearing the newborn's airways if secretions are present;
- providing tactile stimulation;
- administering oxygen if hypoxia is present;
- providing positive-pressure ventilation if there is no response to tactile stimulation.

After stabilization, underlying causes of apnoea should be evaluated and treated, especially if it occurs within the first 24 hours or more than seven days after birth. Management should follow institutional protocols. Caffeine is recommended to treat apnoea in preterm newborns. If caffeine is unavailable, other methylxanthines such as aminophylline or theophylline may be considered.

Skin-to-skin contact can help regulate breathing in preterm newborns and may reduce the incidence of apnoea *(40,41)*. It is essential to educate the mother and additional caregivers about the risk of

Box 8.

Supporting mothers and additional caregivers to recognize and manage apnoea in newborns receiving KMC

- Teach the mother and additional caregivers to observe the newborn's breathing pattern and recognize normal variations, and to understand apnoea and its effects.
- Show the mother and additional caregivers how to use the pulse oximeter, explain the normal SpO_2 range (90–95%), and describe when to alert a provider if levels fall outside this range.
- Demonstrate apnoea by having the mother and additional caregivers hold their breath for 20 seconds or more to distinguish between normal pauses and apnoea.
- Explain that if breathing stops for more than 20 seconds or the newborn becomes blue, it may indicate a serious condition.
- Teach the mother and additional caregivers to gently rub the newborn's back, limbs and soles to stimulate breathing. Stress that they should call for medical assistance immediately if the newborn remains unresponsive.

apnoea, how to recognize it, and how to intervene promptly. Box 8 outlines how health workers can train and support families in recognizing and managing apnoea in newborns receiving KMC.

The onset of a serious illness in small newborns is often subtle and may be overlooked until the disease is advanced and difficult to treat. Health workers and caregivers must remain vigilant and respond promptly to these signs to ensure timely and appropriate care (Video 10). Teach the mother and additional caregivers to recognize common danger signs and encourage them to alert health workers immediately. Treatment should follow institutional guidelines.

Video 10

Danger signs in small newborns

https://globalhealthmedia.org/video/danger-signs-in-the-small-baby/

4.3.6 Providing medical and supportive care to the newborn during KMC

Newborns, including those admitted to a mother–newborn care unit, can receive most medical and supportive care while receiving KMC.

All common procedures (e.g. inserting an intravenous cannula, placement of a nasogastric or orogastric tube, heelprick or blood sampling) and bedside investigations (e.g. cranial ultrasound, echocardiography, examination for retinopathy of prematurity) can be done while the newborn remains in skin-to-skin contact with the mother or additional caregiver (Box 9, Fig. 27 and Video 11).

Box 9.

What can be done in the KMC position?

- Complete examination of the newborn.
- CPAP, other non-invasive ventilation or blended oxygen delivery, including changing of the nasal/facial interface.
- Placement of orogastric or nasogastric tube and tube feeding.
- Placement of intravenous cannula and administration of intravenous medicines, fluids and antibiotics.
- Venous or capillary blood sampling.
- Phototherapy using appropriate equipment.
- Bedside investigations such as cranial ultrasound and echocardiography.
- Examination for retinopathy of prematurity.

Fig. 27. Ultrasound in KMC position

Ultrasound being done in KMC position

Video 11

Clinical procedures in KMC position

https://who.canto.global/b/QJD2T

Painful procedures such as obtaining capillary blood samples can and should be done in the KMC position to mitigate stress for the newborn. Skin-to-skin contact is a safe and effective pain relief measure, reducing both physiological and behavioural indicators of pain and crying time *(42)*.

Since preterm or LBW newborns requiring level 2 (special) or level 3 (intensive) care are likely to be very small or sick, health workers should have adequate training in undertaking these procedures with the newborn in the KMC position. The first few procedures should be done under supervision of an experienced health worker. The mother or additional caregiver should be informed and counselled before any procedure is undertaken. Health workers should give due respect and consideration to the mother's or additional caregiver's decision to remain present during the procedure or not.

The newborn may only need to be moved for weighing and investigations such as chest radiographs that cannot be done in the KMC position, or if an emergency procedure such as resuscitation or intubation is required.

Supportive care in KMC includes the following:

- Maintain adequate hygiene: the diaper area should be cleaned whenever necessary. Dry the newborn's skin gently but thoroughly and quickly to avoid heat loss. Check the newborn's skin folds daily and wipe with a damp cloth to clean any milk residue. Daily bathing is not needed and is not recommended *(43,44)*. The mother should maintain personal hygiene and cleanliness, including frequent handwashing.
- Support exclusive breastfeeding: keep the mother and newborn together unless it is absolutely necessary to separate them. Encourage breastfeeding every two to three hours and whenever the newborn shows hunger cues (see Section 4.3.8).
- Provide developmental supportive care: KMC is key to developmentally supportive care, offering visual, auditory, olfactory, tactile, vestibular and kinaesthetic stimuli that support neurobehavioural development in preterm and LBW newborns. Other aspects of such care include *(45,46)*:
  - reducing noise and light to create a calming environment, while encouraging the caregiver to talk or sing gently to the newborn;
  - clustering care activities to protect sleep and reduce stress;
  - minimizing stress and pain to enhance comfort during procedures;
  - monitoring stress signs (e.g. irregular breathing, desaturation, mottling) while handling the newborn and providing appropriate individualized care such as containment or brief pauses for recovery;
  - placing the newborn in an appropriate, contained position in an incubator or warmer between KMC sessions when the mother needs a break and an additional caregiver is not available to take over from her.
  - supporting the well-being of the mother and additional caregivers;

4.3.7 Caring for the mother providing KMC during the hospital stay

The mother should be supported to stay with the newborn in the mother–newborn care

unit or the KMC area unless she is sick and requires specialized medical care. Irrespective of the location, the mother should receive adequate monitoring and appropriate postnatal care in the health facility alongside her newborn.

For uncomplicated vaginal births, health workers trained in providing postpartum care should monitor the mother every hour for the first four hours after birth, and then every four hours for the first 24 hours.

Review the mother's clinical records and check the following to assess for any complications or special needs:

- Enquire about the mother's overall well-being. Ask whether she is experiencing any pain, excessive bleeding or other symptoms. Check that she has passed urine since the birth and if she is having any difficulty.
- Ask about potential vaginal or perineal tears, fever, chills or breast tenderness.
- Ask how the newborn is doing and whether the mother has been able to breastfeed or express breast milk. Ask about her breast milk production.
- Review the mother's records for any requests for postpartum contraception (e.g. tubal ligation, intrauterine device). If applicable, provide detailed information, offer counselling on her chosen method, and seek informed consent before administration.
- Ask whether the mother has any additional concerns or questions.

Examine the mother for the following:

- pulse, blood pressure and temperature;
- conjunctiva and palms for pallor;
- palpate the abdomen to assess uterine tone;
- assess the amount of vaginal bleeding;
- inspect the perineum for healing of tears or episiotomy;
- inspect the extremities for tenderness or swelling.

Record the findings of your examination in the mother's medical records and provide treatment for any abnormal findings. Ensuring maternal privacy during examinations is paramount and may require local solutions, including use of screens and curtains in the mother–newborn care unit or KMC area.

No routine investigations are recommended in the postpartum period. These should be guided by obstetrical risk factors or conditions present and the clinical examination (e.g. haemoglobin if there was excessive bleeding after birth or if the woman is pale, rapid plasma reagin test if not done during pregnancy and clinically indicated). Offer HIV testing in high HIV-burden settings and screen for tuberculosis in high-prevalence settings.

If the mother is very sick or separated from the newborn for any reason:

- teach the mother to express breast milk (see Section 4.3.8);
- ensure the newborn receives the mother's milk;
- help the mother establish or re-establish breastfeeding as soon as possible.

Health workers caring for mothers in newborn care areas should be aware of maternal fluid and dietary needs, dispensing of maternal medicines, perineal and episiotomy care, and early mobilization. Postpartum care can be adapted to context and circumstances (Box 10)[4].

4.3.8 Supporting exclusive breastfeeding

Oral feeding with colostrum or breast milk should begin as soon as the newborn's condition allows (e.g. newborn stability when handled, normal handling of oral secretions, evidence of rooting reflex or non-nutritive sucking at emptied breast).

The method of initial feeding should be individualized based on the newborn's

[4] WHO IMPAC tools, under preparation

Box 10.

Key advice on postpartum care

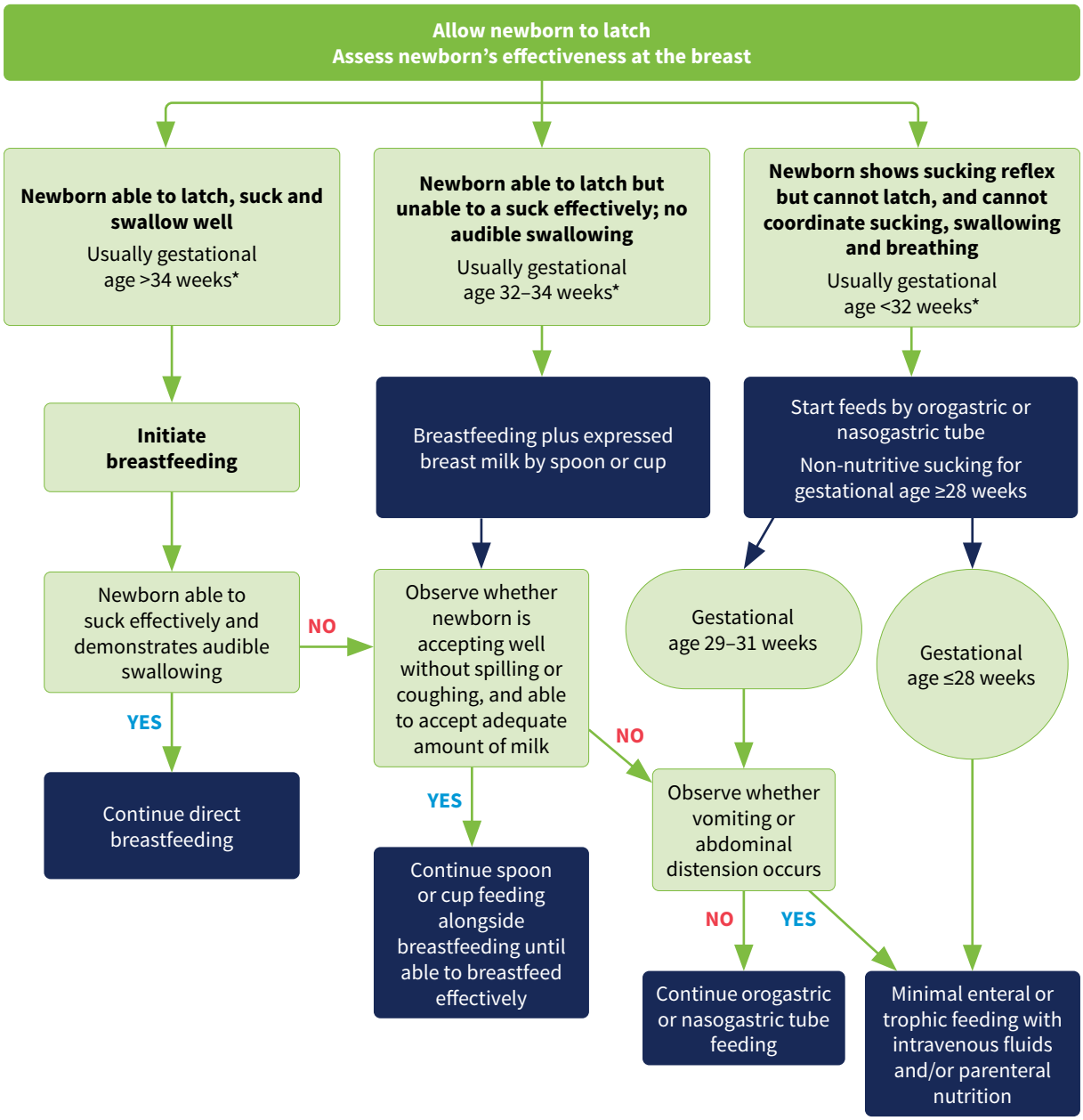
- **Postpartum care and hygiene:**
  - Advise the mother to avoid inserting anything into her vagina.
  - Encourage adequate rest and sleep.
  - Encourage the mother to wash the perineum daily and after bowel movements.
  - Change perineal pads every four to six hours, or more often if lochia is heavy.
  - Safely dispose of or wash used pads.
  - Bathe daily.
- **Nutrition counselling:**
  - Recommend the mother to eat a greater amount and variety of healthy foods (e.g. meat, fish, nuts, vegetables, milk) to help her feel strong and well.
  - Reassure the mother that normal foods will not harm the breastfeeding newborn.
  - Address cultural food taboos and encourage healthy eating.
  - Encourage family support to ensure adequate nutrition and reduce physical exertion.
- **Physical activity:**
  - Emphasize the importance of physical activity and limit sedentary time.
  - Advise at least 20–25 minutes of walking per day, gradually increasing frequency and intensity.
  - Recommend gentle stretching exercises.
  - For mothers with complications or contraindications (e.g. heart disease), tailor advice based on individual clinical needs.

clinical condition, feeding skills, behaviour and tolerance to oral feeds. Preterm or LBW newborns should be assessed individually to decide their readiness or capability to breastfeed, irrespective of the gestational age. Even newborns delivered as early as gestational age 27 weeks can demonstrate the rooting reflex and latch to breastfeed *(30,47)*. As long as the newborn is haemodynamically stable and shows no signs of severe apnoea, breastfeeding can be initiated.

Using a newborn-led approach is ideal as it allows the newborn to guide the feeding process based on their natural cues and needs. Nevertheless, general guidance on the initial method of feeding based on gestational age is provided (see Fig. 28):

- Newborns of gestational age less than 32 weeks may have difficulty in coordinating the suck, swallow and breathing reflexes and may require nasogastric or orogastric tube feeding until they develop the necessary skills for direct breastfeeding. Tube feeding can be done in the KMC position (Fig. 29). During tube feeding, the mother can allow the newborn to engage in non-nutritive suckling (suckling at the breast without extracting milk). If the mother has large volumes of milk, she may need to express first. Non-nutritive suckling should be encouraged to introduce the newborn to the breast even before achieving oral competency.

Fig. 28. Guidance for initial method of feeding for preterm or LBW newborns



* Gestational age is indicative. The method of initial feeding should be individualized based on the newborn's clinical condition, feeding skills, behaviour and tolerance to oral feeds. Using a newborn-led approach is ideal.

- Newborns of gestational age 32–34 weeks are better able to coordinate sucking, swallowing and breathing, but their suckling may not be effective to achieve adequate intake, and they may fatigue quickly. The newborn should be offered short frequent breastfeeds and additional intake of expressed breast milk as required via cup or spoon feeding. For cup feeding, the newborn should be positioned upright or in a reclined posture while maintaining skin-to-skin contact and returned to the KMC position after the feed (Fig. 30). It is important to support the newborn and bring their hands to the midline, because this promotes developmental coordination. When cup feeding, the newborn should be encouraged to control the flow of milk

Fig. 29 Tube feeding in KMC position

A premature newborn is fed breast milk through a tube

and lap it at their own pace, promoting their ability to self-regulate feeding. Even if the newborn is not suckling effectively, the mother should offer the breast first, followed by cup or spoon feeding.

- Many (but not all) newborns of gestational age 34 weeks or more are able to coordinate sucking, swallowing and breathing, have more stamina, and are able to breastfeed more effectively. Cup or spoon feeding with expressed breast milk may still be required if they are unable to achieve adequate intake.

Newborn feeding behaviour should be supported by encouraging prolonged skin-to-skin contact (at least eight hours per day). Promote brief practice times at the breast using appropriate breastfeeding positions to help develop the newborn's skills. If the newborn is unable to achieve adequate intake, the mother should be supported to express after feeds to provide breast milk for top-up feeding by cup/spoon as required, to empty the breasts, and to maintain adequate milk production.

Fig. 30. Cup feeding in KMC position

Newborn receiving expressed breast milk via a cup while in the KMC position

Video 12

Breastfeeding a small newborn

https://globalhealthmedia.org/video/breastfeeding-the-small-baby/

Video 13

Breastfeeding in KMC position

https://who.canto.global/b/V25V2

Supporting breastfeeding during KMC

A preterm or LBW newborn who can latch, suck and swallow effectively may breastfeed directly after birth. The mother should be counselled on the benefits of breast milk, and the dangers of introducing food or fluids other than breast milk before six months, and taught to breastfeed while maintaining skin-to-skin contact (Box 11). For first-time KMC mothers, guided instruction and demonstrations on breastfeeding in this position are crucial. With time and support, mothers can gain confidence and independence, but ongoing supervision may be needed (Fig. 32).

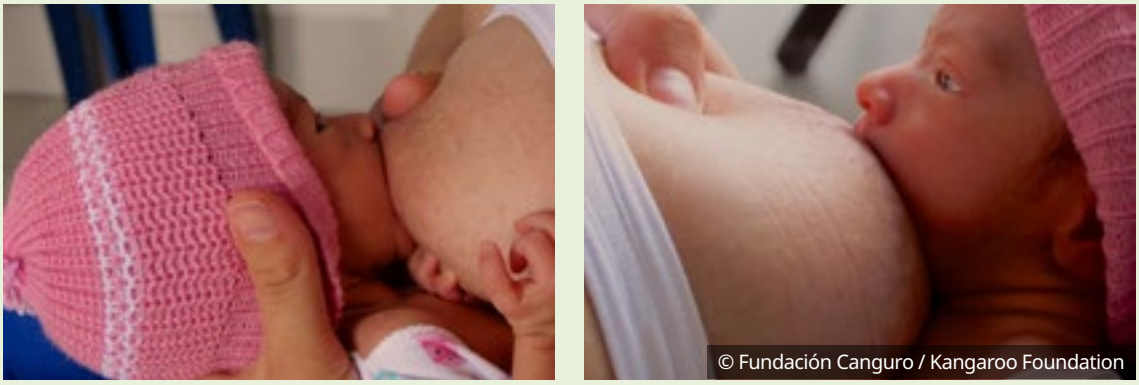
Box 11.

Step-by-step guidance for breastfeeding during KMC

- Reassure the mother that she can breastfeed her small newborn and she has enough milk.
- Explain that her milk is the best food for such a small newborn, and feeding is even more important than for bigger newborns.
- Explain that initially, a small newborn may have difficulty feeding effectively and may:
  - not always wake up for feeds;
  - suckle weakly and in short bursts, with long pauses between the bursts;
  - swallow infrequently;
  - tire easily and fall asleep during feeding.
- Reassure the mother that breastfeeding will become easier as the newborn grows.
- Teach the mother to identify signs that the newborn is ready to feed, such as rooting (turning head towards the breast), sucking on hands or making sucking noises.
- Encourage the mother to feed the newborn as soon as hunger cues are observed. Breastfeed at least 8–12 times in 24 hours.
- The newborn may self-attach while in the KMC position, with the mother in the reclining position. Ensure the binder is not too tight so the newborn can exhibit the rooting reflex and move towards the breast. If needed, demonstrate alternative positions for better support.
- Help the mother position the newborn:
  - Wash hands.
  - Loosen or remove the binder so the newborn can be positioned comfortably but remain covered.
  - Hold the newborn close, ensuring maximum skin-to-skin contact.
  - Support the newborn's body, not just the neck and shoulders, for stability. Make sure the newborn's ear, shoulder and hip are in a straight line, aligned to the midline of the body.
  - The newborn's face should face the mother's breast, with the nose directly opposite the nipple. The nipple should be at the same level as the tip of the baby's nose.
- Show the mother how to help the newborn attach to the breast:
  - Gently brush the nipple across the newborn's lips.
  - Wait for the newborn to open their mouth wide and gently pull the newborn towards the breast.
  - As the newborn's mouth closes, either let the newborn self-attach or guide the mouth on to the breast, ensuring the lower lip is well below the nipple.
  - Support the breast if needed (teach the mother to place her fingers under the breast and her thumb on top, forming a "C" well behind the areola) to help guide the breast for deeper attachment.
  - Ensure the newborn's body is close to the mother's so the newborn's chin is deep in the breast and the nose is free. The newborn's hip, shoulder and ear should be in a straight line. The newborn's body should be touching the mother's body from upper sternum (manubrium) to knee.

  - Once the newborn is positioned, button clothes over the newborn and cover with a blanket.
  - Ensure the mother's comfort during feeding.
- Show the mother signs of good attachment (Fig. 31):
  - The newborn's chin should be touching the breast.
  - The newborn's mouth should be wide open.
  - The newborn's lower lip turned outward.
  - More areola should be visible above than below the newborn's mouth.

Fig. 31. A newborn well attached to the breast



Mother supporting the newborn to attach at the breast

Breastfeeding should not be painful. The mother may experience an uncomfortable sensation during the first few seconds, but this should pass.

- Discuss signs of effective breastfeeding with the mother:
  - Signs include rhythmic jaw movements, visible and audible swallowing, breast softening after feeding, newborn contented and sleeping after feeds, frequent wet nappies (diapers) and stool, and appropriate daily weight gain *(48)*. However, preterm infants, particularly those born very preterm, often exhibit immature suck-swallow-breathe coordination and may be unable to effectively extract sufficient milk to adequately empty the breast. These infants may also demonstrate sleepiness irrespective of intake, making behavioural cues less reliable. In such cases, urine output and weight gain remain the most objective and clinically useful indicators of adequate milk transfer.
- Support the mother to learn techniques for increasing milk transfer:
  - Increase milk flow and maintain the newborn's interest in suckling by teaching the mother to use her free hand to compress the breast gently when the newborn takes a pause between bouts of suckling.
  - Encourage the mother to let the newborn suck at the first breast until suckling becomes ineffective and the newborn is sleepy, and then offer the other breast.
  - The degree of breast emptying will differ between feeds. Sometimes the mother may feel the breast empty quickly and will need to switch sides more than once during feeding.
- Show the mother how to return the newborn to the KMC position after feeding:
  - Change the diaper if required. Gently return the newborn to the KMC position and adjust or tie the binder to ensure the newborn is well positioned and secure.
  - Wash hands after handling the newborn.

Fig. 32. Direct breastfeeding in KMC position

A small newborn being put to the breast for direct breastfeeding

If the newborn does not self-attach while the mother is in a reclining position with the newborn in the KMC position, the newborn can be fed skin-to-skin using a different breastfeeding position that may provide more support for the newborn's head and body. The different breastfeeding position are described in Annex 1 and Video 14. For all breastfeeding positions:

- the newborn should be close to and facing the mother's body, with the newborn's head and body in a straight line;
- support the newborn's neck and shoulders (a very small newborn may need support at the hairline);
- allow the newborn to tilt their head back and bring the chin into the breast to achieve a deep latch with the nipple at the back of the mouth.
- always bring the newborn to the breast.

Video 14

Breastfeeding positions for health workers

https://youtu.be/NS8UyAQexBg

Increasing milk transfer

Breastfeeding can be challenging for preterm or LBW newborns. Frequent observation and guidance are essential until both the mother and the newborn are comfortable. Keep the following in mind:

- When a small newborn starts to suckle effectively,[5] they may pause frequently and for long periods. Avoid removing the newborn from the breast too soon. Leave the newborn on the breast to suckle again and support effective milk transfer by showing the mother to compress the breast when the newborn takes a pause between bouts of suckling.
- Allow the newborn to suckle for as long as they want. If there are long pauses between sucks, do not interrupt if the newborn is still attempting to feed.
- Small newborns need to breastfeed every two to three hours. Initially, they may not wake up for feeds and may need to be woken.
- If the breast is engorged, encourage the mother to express some milk before breastfeeding to soften the areola, making it easier for the newborn to latch.
- Expressing milk from the one breast while feeding from the other can improve milk yield and has little impact on the volume of milk available for the newborn.
- If the newborn cannot achieve adequate milk transfer, the mother may need to express breast milk and feed the newborn with a cup or spoon after each breastfeeding session.
- Newborns delivered before 34 weeks gestational age may benefit from scheduled feeding, but awareness of infant feeding cues are important. After 34 weeks gestation the newborn requiring alternate feeding may respond well to responsive feeding (i.e. feeding in response to newborn visual and auditory cues of hunger and satiety, such as crying, hand–mouth motions, suckling and awakeness). The mother should be supported to recognize and respond to feeding cues. Counsel and give practical support for the alternative feeding method and responsive feeding until transition to full, direct breastfeeding.

Alternative modes of feeding

For newborns who cannot breastfeed effectively but can accept oral feeds, expressed breast milk can be given by cup, spoon, syringe or dropper *(49,50)*:

- Feed according to the newborn's cues, with at least eight feeds per day (around 2–3 hourly), while the newborn is awake and alert.
- Determine the amount to be fed, based on the newborn's weight and age.
- Place a measured amount of milk in the cup or spoon.
- Loosen the binder and position the newborn semi-upright.
- Rest the cup lightly on the newborn's lower lip, touching the outer upper lip.
- Tip the cup so milk reaches the newborn's lips.
- Allow the newborn to take the milk at their own pace. To avoid choking, do not pour milk into the newborn's mouth.
- Allow the newborn to take small amounts frequently.
- Continue each feed for up to 30 minutes.
- The newborn is finished when they no longer accept milk by lapping or sucking motions, the mouth closes, and they no longer appear interested.
- Place the newborn back in the KMC position and ensure the binder is secured properly.

[5] Signs of effective suckling include slow, deep, rhythmic sucking, with occasional pauses (see or hear the newborn swallowing after one or two sucks from day 3). Signs of mature suckling include episodes of 10–30 deep, rhythmic sucks and swallows, followed by a short pause, and coordinated sucking, swallowing and breathing.

Expressing breast milk

Health workers should encourage and support mothers to express breast milk 8–12 times within 24 hours, including at least once at night, to establish and maintain milk supply. More frequent expressing in the evening can help the mother achieve a longer pause during the night. Initially no more than four to five hours should pass between expressing sessions, because long delays may have a negative impact on milk production. The mother should be assisted to keep the newborn in skin-to-skin contact during milk expression to increase milk yield and stimulate feeding reflexes (Video 15). It is not necessary to express milk at fixed or uniform intervals throughout the day, but it is important to express as much milk as possible in each session to prevent engorgement, stimulate milk syntheses, and prevent involution of mammary tissues which can limit a mother's capacity to meet the needs of a growing infant. The mother should continue to pump until the milk flow decreases to occasional drops (usually 5–15 minutes per breast).

Encourage the mother to vary the timing of expression to fit in with her day, and explain that not every day has to be the same. Mothers of preterm or LBW newborns should be encouraged to express more milk than their newborns currently need until the newborn is able to meet its nutritional needs through breastfeeding alone. Expressing extra milk in the early neonatal period is essential for establishing and maintaining an adequate milk supply, ensuring the newborn's growing nutritional needs are met as the newborn grows and their energy needs increase.

All mothers should be taught proper hygienic hand expression techniques. If available, an electric or manual breast pump can be used after the onset of copious milk production. The mother should be shown safe, effective use and proper cleaning of the pump. Initially, the health worker should assess the mother's pumping technique and address any issues, including pain or incorrect breast flange size. Further assessments should be conducted as required. It is essential to prioritize hand hygiene when handling expressed milk. Guidance on storage, labelling and use of expressed breast milk to ensure it is safe and nutritious is provided in referenced resource materials *(51–53)*. Fresh milk should be prioritized over refrigerated milk, as long as the refrigerated milk will not expire *(54,55)*. Always follow local guidelines if available.

Video 15

Expressing breast milk in KMC position

https://who.canto.global/b/NVSNV

Daily yield of expressed breast milk

Establishing a full milk supply can be particularly challenging for mothers of preterm or LBW newborns. Health workers should encourage the father and close family members to support the mother so she is able to express frequently and to monitor the total daily milk yield. Milk expression yields vary, and Table 5 shows the average volume of a full milk supply.

The mother should be encouraged to keep a record of the milk expressed to provide early opportunities for remediation if the volume falters. Techniques for increasing milk supply encourage effective, frequent emptying of the breast, including:

- checking the newborn's latch at the breast;
- expressing and/or breastfeeding more frequently;

Table 5. Average volume of breast milk by day

Time since birth	Volume each pumping (both breasts)	Volume per day[a]
Day 1–2	Drops to 20 mL	Drops to 120 mL
Day 3	25–45 mL	160–360 mL
Day 4–5	50–60 mL	400–600 mL
Day 6–9	75–90 mL	600–720 mL
Day 10 and beyond (to maintain supply)	90 mL or more	720 mL

[a] Volumes expected with pumping combined with hand expressions after pumping at least eight times in 24 hours.

Based on data from *(30)*.

- compressing the breast when the newborn takes a pause between suckling;
- breastfeeding the newborn on both sides at each feed, and switching sides more than once during feeding;
- combining hand expression and pumping with gentle massage techniques (hands-on pumping) *(56)*.

Encourage the mother and the family to focus on total daily yield rather than the volume expressed at any one time (which can be discouraging). Health workers should be aware of the mother's ongoing milk volume and refer the mother for specialized lactation assessment and care if volumes fall short of guidance goals. Offer encouragement and reassurance to the mother, even if she is producing only small amounts of breast milk, emphasizing that every drop is valuable for her newborn.

Volume of expressed breast milk to be fed to the newborn per day

Calculating the fluid and feed volume requirements is essential for newborns on alternative modes of feeding. The daily

Labeled expressed breast milk stored safely in the refrigerator

Box 12.

Support for mothers breastfeeding twins

- Reassure the mother that she has enough breast milk for two newborns.
- Explain that twins may take longer to establish breastfeeding, particularly if they are preterm or LBW.
- Encourage the mother to feed one newborn at a time until breastfeeding is well established.
- Help the mother find the best method for her twins. If one twin is weaker than the other, encourage the mother to make sure the weaker twin gets enough milk. If necessary, the mother can express milk and cup feed after initial breastfeeding.
- Offer both twins both sides at each feed. The newborns will have differing abilities to drain the breast, and the breasts will have differing levels of milk production.

newborn fluid requirement is determined based on the estimated insensible water loss, other losses and urine output, as well as the newborn's age and weight. Protocols vary across settings, but general guidance is to start at 60–80 mL/kg/day given every two to three hours, with increments of 30–40 mL/kg/day, depending on the newborn's tolerance, to reach up to 180 mL/kg/day. In some preterm or LBW newborns, enteral intakes up to 200 mL/kg/day or more may be appropriate and safe, depending on the newborn's current health status such as the presence of a significant patent ductus arteriosus or bronchopulmonary dysplasia.

Detailed guidance on feeding volumes and transitioning to full direct breastfeeding is available in the referenced resource materials *(48)*.

Ongoing support for breastfeeding

Ongoing support, reassurance and guidance are crucial for helping mothers of preterm or LBW newborns breastfeed successfully. Many mothers face their own health challenges and need additional support and encouragement to continue breastfeeding. Late preterm newborns can breastfeed directly in most cases but are at greater risk for jaundice, hypoglycaemia and feeding difficulties, requiring extra vigilance. Mothers breastfeeding twins will need extra support (Box 12).

A well-fed newborn shows steady weight gain and has at least six wet nappies (diapers) a day. Stool frequency should become more consistent as the newborn matures. The mother's breast will soften after feeding, although this may take longer for a preterm or LBW newborn. Preterm or LBW newborns need frequent, short feeds but should become alert and satisfied as they grow. Annex 2 provides guidance on monitoring newborn growth to assess nutritional status and feeding adequacy, identify inadequate weight gain, and manage common underlying causes.

Enteral iron supplementation is recommended for preterm or LBW newborns on breast milk and not receiving iron from another source. A daily dose of 2–4 mg/kg/day of elemental iron may be initiated when enteral feeds are well established and may be continued until the newborn receives iron from another source *(5)*. The recommendations for other micronutrients remain conditional on shared decision-making with the newborn's parents. This includes informing parents about the benefits and risks, and the need for further research (Annex 3).

4.4 Monitoring the initiation, duration and quality of KMC in the health facility

Collecting and utilizing health facility-level data – whether paper-based, digital or a combination of both – is essential for identifying problems early, triggering corrective actions, and supporting decision-making to improve implementation. Therefore, recording the implementation of KMC and care for small and/or sick newborns using specific indicators in health facilities is crucial for tracking and improving the coverage and quality of these services. These indicators should be incorporated into routine health management information systems to enable continuous monitoring and ongoing improvement.

The KMC-related data should be recorded in a dedicated register at least daily, but ideally every six hours to ensure complete recording and avoid recall bias. Key information to be collected includes the date and time (or age of the newborn in hours) when KMC was initiated, the newborn's weight at the time of KMC initiation, the number of hours that the newborn was in skin-to-skin contact, and the number of times the newborn received breast milk or was fed anything other than breast milk. Some of this information can be obtained through dialogue between doctors, nurses, midwives and the mother. The mother may be aided by using a sheet to record the provision of KMC on a regular basis. It is also useful to record the newborn's temperature and daily weight. Example sheets for monitoring the provision of skin-to-skin contact and breastfeeding are included in Annex 4.

The data from KMC-specific registers can be collated on a monthly basis to help ascertain KMC coverage and quality in the health facility. Key information from the register can be entered in the health facility information system to track KMC coverage in the newborn care unit or health facility and to facilitate quality improvement activities (Box 13).

It is also helpful to document key indicators related to the care for small and/or sick newborns in the health facility, such as the number of newborns of gestational age less than 34 weeks who received antenatal corticosteroids, or the proportion who had hypothermia.

Box 13. Routine data to monitor KMC coverage and quality in health facilities

- Percentage of preterm or LBW newborns who received KMC (8–24 hours of skin-to-skin contact per day and exclusive breastfeeding).
- Age at initiation of skin-to-skin contact for preterm or LBW newborns who received KMC.
- Duration of skin-to-skin contact per day for preterm or LBW newborns who received KMC.
- Duration of skin-to-skin contact and frequency of exclusive breastfeeding in the 24 hours before discharge for preterm or LBW newborns who received KMC.
- Reasons for not initiating KMC for newborns who did not receive it.
- Proportion of preterm or LBW newborns who are exclusively breastfed at discharge.
- Age at initiation of breast milk feeding and age at initiation of direct breastfeeding for preterm or LBW newborns.

It would be helpful to analyse these data separately for preterm or LBW newborns who required admission to the newborn care unit and those who did not.

Box 14.

WHO/ENAP proposed indicator for measuring KMC coverage at the health facility level[a]

$$\text{KMC coverage} = \frac{\text{Number of newborns with birth weight less than 2 500 g placed in KMC position anywhere in the facility}}{\text{Number of admitted newborns with birth weight less than 2 500 g}}$$

[a] This indicator is simple and easy to measure in routine health systems, but it may capture brief skin-to-skin contact within the first hour after birth in the numerator, which does not align with the intended definition of 'prolonged' skin-to-skin contact required for KMC.

Countries should develop a national-level monitoring and evaluation framework and incorporate some priority KMC indicators into their national health management information systems alongside other indicators for small and/or sick newborn care.

WHO has refined the KMC coverage indicator for the Every Newborn Action Plan (ENAP) based on a multi-country validation study. The numerator is the number of newborns weighing less than 2500 g who are initiated on KMC (placed in skin-to-skin contact or KMC position) anywhere in the health facility, and the denominator is the number of admitted newborns (born in a hospital or referred from elsewhere) with birth weight less than 2500 g (Box 14) *(57)*. One potential limitation of this indicator is that, although it is feasible to measure within routine health systems, it may inaccurately record any skin-to-skin contact within the first hour after birth – even if brief – as meeting the criteria. This does not reflect the intended definition of 'prolonged' skin-to-skin contact required for KMC. A sub-tabulation for neonates weighing less than 2000 g was also recommended where possible, but this requires improvements in the quality of weighing techniques after birth, including using digital weighing scales to mitigate the issue of 'heaping' (or disproportionate clustering) at 2500 g, which may inadvertently exclude newborns who could benefit from KMC.

4.5 Preparing for discharge for continued KMC at home

Before discharge, the mother and family should be fully prepared to provide safe, responsive and nurturing care at home, including continued KMC. This preparation involves providing comprehensive information, counselling and support during their hospital stay. Ensuring proper preparation helps caregivers feel confident and ready for the transition, leading to better outcomes for the mother and the newborn.

4.5.1 Discharge criteria

Before discharging the mother and newborn from the health facility, health workers should assess the following criteria to improve maternal and newborn outcomes *(58)*:

- The mother's and newborn's physical well-being and the mother's emotional well-being.
- The skills and confidence of the mother to care for herself, and the skills and confidence of the parents and additional caregivers to care for the newborn.

- The home environment and other factors that may influence the ability to provide care for the mother and the newborn at home, and care-seeking behaviour.

Discharge criteria vary by country, but key considerations for deciding whether a preterm or LBW newborn receiving KMC is ready for discharge include:

- no physical illness or condition (e.g. apnoea) that would prevent discharge;
- completion of newborn screenings, including eye and hearing tests;
- newborn can maintain a body temperature of 36.5–37.5 °C during KMC;
- newborn is feeding well and has gained adequate weight for three consecutive days;
- mother and family are confident in caring for the newborn, including continuing KMC;
- mother practises appropriate hand hygiene (e.g. before and after caregiving, after exposure to body fluids, and after touching her surroundings);
- mother is aware of danger signs and knows when and where to seek help, if necessary;
- family has been successfully connected to appropriate follow-up services for continued care and support.

4.5.2 Discharge counselling and support

Discharge counselling should be done by a trained health worker in the presence of the mother, her partner and any family members who will stay with her (Fig. 33). It is important that they understand that a preterm or LBW newborn continues to need special care after going home from hospital, including continued KMC at home up to the corrected gestational age of 40 weeks. This is essential owing to the higher risk of health problems such as hypothermia, infections, poor growth and development. The need for more frequent follow-up visits according to national guidelines should be explained. Box 15 outlines the key components to be included in discharge counselling (Video 16).

Specific counselling is essential to ensure the mother and family are fully prepared and supported in continuing KMC at home after discharge. The home environment

Box 15.

Discharge counselling: key components

- Newborn care: guidance on continued KMC at home, feeding and iron supplementation, hygiene, cord care, supine sleeping when not in KMC, responsive care, developmental milestones and immunizations.
- Maternal care: counselling on postpartum care, including hygiene, nutrition, rest, the importance of support at home, return to fertility, birth spacing or family planning, resumption of sexual activity and safer sex practices, physical activity, and preventing postpartum pelvic floor muscle dysfunction.
- Follow-up care: review the follow-up visitation plan with the parents and schedule the required appointments. Emphasize the importance of regular check-ups for ongoing monitoring, guidance and support.
- Recognizing danger signs and emergency preparedness: ensure the mother, father and additional caregivers can recognize danger signs in the mother and the newborn. Provide guidance on emergency preparedness, including when and where to seek help (e.g. emergency telephone numbers, nearest health facilities etc.) and the importance of immediate action to avoid delays in care.

Fig. 33. Discharge preparation and counselling

Health worker counselling the parents during their stay in the in mother-newborn care unit in preparation for discharge

Health worker counselling the parents at the time of discharge

differs from the hospital setting, and it is important to address these differences in advance so the parents can make the necessary preparations and mentally prepare themselves for the transition. Additionally, discuss the need for extra support for the mother, and help make additional arrangements if required. The following key points should be discussed:

- Guide the mother and additional caregivers on how to set up and practise KMC at

Video 16

Discharge preparation and counselling

https://who.canto.global/b/NRMJF

home, emphasizing that it is safe and can be done effectively with minimal resources:
  - Choose a warm, quiet room with a temperature of at least 25 °C for KMC sessions, where both the mother and the newborn can relax.
  - Suggest arrangements for a chair or bed with adequate back and arm support for the mother, especially for longer KMC sessions, ensuring privacy as needed.
  - Advise the mother to wear light, culturally appropriate, easy-to-open clothes such as a button-down shirt, and to keep the newborn securely nestled on the mother's chest.
  - Encourage the family to support the mother, enabling her to provide at least eight hours of skin-to-skin contact daily until the newborn starts to wriggle out of the KMC position.
- Counsel regarding feeding based on the feeding plan that supported the newborn's steady growth before discharge:
  - Emphasize the importance of exclusive breastfeeding for the first six months. Discuss common breastfeeding problems (e.g. reduced milk supply, pain, mastitis) and when and where to seek help if challenges arise. If breast milk substitutes or supplements are needed after discharge, work with the family to develop a feeding plan, including clear, understandable and accessible instructions (e.g. pictorial for people who may not be able to read) and hands-on training on safely preparing, storing and using these products before leaving the health facility.
- Explain how KMC can be seamlessly integrated into daily routines, balancing the newborn's needs with the mother's self-care. The mother can follow her daily routine with the newborn in skin-to-skin contact, as long as the newborn is securely fastened and is not exposed to environmental hazards.

Ensure direct communication with the follow-up providers through written summaries, covering the newborn's issues, treatment, growth and special follow-up needs. Provide educational materials (e.g. written or digital booklets, pictorials for people who may not be able to read) to support understanding. Confirm that the parents understand the information and address any questions.

4.5.3 Supporting the transition to home

Encourage the parents to take the newborn home in the KMC position and support them in the process (Fig. 34). Discuss practical considerations, such as the type of clothing the mother should wear, transport arrangements, and how to communicate with family and neighbours at home. Discuss any concerns the family may have and find feasible solutions. The same guidelines should apply when bringing the newborn back for follow-up visits.

With proper guidance and support, parents can feel empowered to ensure a smooth, stress-free transition from hospital to home.

Fig. 34. Newborns discharged home in KMC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Parents taking their newborn(s) home in the KMC position after discharge

Father and grandmother assist the mother in securing the newborn in the KMC position
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Section

5

5. Supporting mothers and families to practise KMC at home

All preterm or LBW newborns who are initiated on KMC in health facilities should continue to receive KMC at home following discharge. KMC can also be started at home for preterm or LBW newborns who are born at home and do not require admission to a newborn care unit (based on the newborn assessment by a trained health worker, including birth weight and gestational age, ideally within 24 hours after birth) (Fig. 35).

5.1 Key requirements and considerations for KMC at home

Countries can adapt the following requirements and considerations for KMC at home to align with local organization of community-based maternal and newborn services:

- National policies and guidelines should include KMC as part of the comprehensive community care package for mothers and newborns. These policies should include the number, frequency, duration

Fig. 35. Home visit by health workers

Health workers counsel a mother practicing KMC at home

and content of home visits for preterm or LBW newborns, and the health worker responsible.

- Mechanisms for community-based care differ by country. They may include community clinics, home visits by community-level health workers (e.g. midwives, community health workers, outreach workers from community clinics or health facilities), and health facility outreach services. KMC can be initiated or supported at home through any of these channels. Some settings have groups of women or peers who are not trained workers but can support the mother and family on an ongoing basis once KMC has started.
- The roles and responsibilities of community-level health workers should be clearly defined. They must undergo hands-on training in health facilities that implement KMC before supporting mothers at home. Some level of supervision should be provided at the start. It is essential for them to have access to equipment such as weighing scales and thermometers. Training should cover:
  - identification of preterm or LBW newborns;
  - assessing for danger signs;
  - facilitating safe referrals;
  - breastfeeding and lactation counselling;
  - supporting, evaluating and problem-solving KMC at home.
- Many countries have home-based records containing the newborn's birth weight, other important information about the newborn, and notes from consultations with health workers. The mother and family should record the daily duration of skin-to-skin contact and exclusive breastfeeding at home to ensure continuity of care and support monitoring of the newborn's health. It is important to note when skin-to-skin contact and exclusive breastfeeding are stopped. Countries should review and decide what information can be added to their home-based records.
- A clear referral system must be in place, with defined criteria for when small and/or sick newborns need to be referred to a higher-level health facility. Effective communication between community health workers and referral health facilities is essential, including properly written referral notes. It is important to identify in advance transport options for routine follow-up visits and emergencies. Community-organized transport schemes are recommended in settings where other sources of transport are less sustainable and not reliable. Measures should be taken to ensure the sustainability, efficacy and reliability of these schemes while seeking long-term solutions to transport *(59)*.

5.2 Specific considerations for KMC started at home

For home births, the first postnatal contact by a trained health worker should be made as soon as possible within 24 hours of birth.

At the first contact, a trained health worker should weigh and examine the newborn to identify whether they are preterm or LBW, and whether they require admission to a newborn care unit, based on the country policies and guidelines. Generally, any newborns below the country cut-off for birth weight or gestational age for admission to a newborn care unit and any newborns above the cut-off but with risk factors or danger signs requiring further evaluation should be referred to a health facility.

The family should be advised to transport the mother and newborn together in the KMC position and continue breastfeeding if the newborn is accepting the feeds. The family should be followed up and encouraged to comply with referral advice. If referral is not feasible or the family refuses, KMC may be initiated at home under close monitoring and supervision. The parents and family should be encouraged to get the newborn evaluated at the nearest health facility as soon as possible.

Preterm or LBW newborns who do not require admission to a health facility according to the national policies and guidelines can be started on KMC at home.

5.2.1 Identifying preterm or LBW newborns at home

Although it may be easy to identify LBW newborns in the community, it may be difficult to identify preterm newborns unless they are also LBW. A reliable gestational age based on the mother's last menstrual period or ultrasound may not be available, or health workers may not be trained in using these to determine gestational age. Identification and follow-up of pregnant women in the community, with higher frequency from the seventh month of gestation, is an important step for early identification of preterm newborns. A pregnancy wheel (Annex 5), generally used during antenatal consultations, can also be used to see whether the newborn was born before the expected date of delivery if the mother knows the date of her last menstrual period.

5.2.2 Examining the newborn at home

Health workers can use the following procedure to examine a small newborn (Video 17):

- Introduce yourself, explain what you will do, and obtain maternal or parental consent.
- Observe and ask the mother about the newborn's cry, activity and feeding. Observe the newborn's clothing, room temperature, cleanliness of the surroundings, and newborn care practices.
- Follow proper hand hygiene.
- Note the newborn's vital signs and identify any danger signs. Examine the newborn top to toe, front and back. Observe the newborn's skin, including the colour, and the newborn's activity, posture and tone.

Video 17

Newborn physical exam in community

https://globalhealthmedia.org/video/newborn-physical-exam/

- Observe breastfeeding and support the mother to learn techniques that support effective milk transfer. Teaching hand expression and cup feeding is beneficial for all families of small newborns.
- Counsel the mother regarding daily hygiene.
- Weigh the newborn, review the maternal history, and use a pregnancy wheel to determine whether the newborn is preterm or LBW and is eligible for KMC.

5.2.3 Preparing, counselling and supporting the mother and family

After ensuring the preterm or LBW newborn does not require specialized care in a health facility, the health worker should counsel the mother and family about KMC and support the mother to start KMC in their presence. The health worker should help the mother place the newborn in the KMC position and observe breastfeeding (Fig. 36). Advise the mother to practise KMC in the semi-reclining or supine position in which she is most comfortable. The mother's partner and other family members should be taught and encouraged to provide skin-to-skin contact when the mother needs a break (Box 16). Always check whether the mother is confident to do KMC and demonstrate the practice appropriately.

Fig. 36. Health worker supporting a mother in initiating KMC at home

A community-based health worker assists the mother in placing the newborn in the KMC position and securing him/her with a binder and wearing a garment on top

Box 16.

Preparing and counselling the mother and family for KMC at home

- Explain the benefits of KMC.
- Encourage the mother to practise KMC for at least eight hours each day.
- Demonstrate the KMC technique, including:
  - skin-to-skin contact in the correct KMC position;
  - breastfeeding;
  - changing nappies (diapers) and breastfeeding while maintaining skin-to-skin contact.

The home and hospital environments are vastly different. There may be resource constraints, and a reclining bed or KMC chair may not be available at home. Local solutions should be explored, such as using pillows to support the mother seated against a wall. Other considerations include ensuring adequate hygiene, ensuring access to clean water for feeding supplies and handwashing, and providing alternative sources of warmth when the mother is occupied with other activities. The parents should be guided in overcoming practical challenges, such as providing prolonged skin-to-skin contact while performing household chores or when both parents are working. The parents can be linked to social support services, where available, to manage logistical or financial barriers and encouraged to involve other family members in caring for the newborn and the mother.

Counselling for mothers, parents and/or family members on KMC at home should incorporate the following guidance:

- Ensure the newborn is feeding well, kept warm, clean, nurtured and sleeping safely.
- Exclusive breastfeeding:
  - If possible, maintain exclusive breastfeeding day and night.
  - Be responsive to the newborn's behaviours and cues.
  - Seek assistance for any breastfeeding difficulties.
- Thermal care in the home environment:
  - In cold climates, keep one room or a designated part of the home warm, but avoid smoke exposure (especially with open flames).
  - When not in skin-to-skin contact, dress the newborn in one or more layers in addition to what is worn by other children or adults.
  - Ensure the newborn is not left in wet nappies (diapers).
  - Advise caregivers about adjusting clothing if temperatures fluctuate during the day.

  - At night, allow the newborn to sleep with the mother in KMC position.
  - Ensure continuous skin-to-skin contact for warmth and bonding.
- Maintain cleanliness for the newborn and home:
  - Wash hands frequently.
  - Avoid putting anything in the newborn's eyes or ears or on the umbilical cord stump.
  - Keep the diaper below the umbilical stump. If the stump is wet, wash with clean water and soap, and then dry with a clean cloth.
  - If the stump is red or there is any discharge (pus or blood), seek help from a health-care professional.
  - Do not bathe the newborn until the newborn is able to maintain normal body temperature on their own, without KMC. You can wipe the face, neck, armpits and groin.
  - Clean the newborn's buttocks when soiled.
  - Once the umbilical stump has fallen off, newborn can be bathed occasionally in a warm, draught-free room using warm water, and dry thoroughly afterwards.
  - Use cloth or nappies (diapers) to collect stool and urine, and dispose of them safely to prevent infections and contamination of water sources.
  - Wash hands after any contact with the newborn's waste.
- Review sleeping arrangements:
  - Ensure the newborn's sleeping arrangements are safe, and make a shared sleep space safe for an infant and prevent unplanned, unsafe bed-sharing.

Fig. 37. Home-based KMC

Mother providing KMC at home

5.3 Practical considerations for supporting effective KMC at home

Several factors must be considered to help mothers and families provide effective KMC at home. The following considerations can assist health workers in addressing challenges faced by mothers and families practising KMC at home. This guidance should be contextualized based on specific needs and may vary across different environments:

- In hot climates, particularly during summer, advise the family to use a fan without directing it at the newborn. Hand-operated fans can be used during power outages or in homes without electricity.
- To avoid undressing the newborn in colder weather, consider using front-opening clothes, which allow the newborn to be placed on the mother's chest before the clothes are removed.
- The mother may need reassurance that KMC can be practised at night while she sleeps with the newborn. The mother should ideally be in a semi-reclined position, and the newborn must be secured properly with a binder *(7)*. When the newborn is not in KMC, they should sleep in a supine position on a firm

surface. Keep loose blankets, pillows, stuffed toys and other soft items out of the sleep space (Box 17). Mothers who smoke should be supported to continue breastfeeding, reduce their infant's exposure to tobacco smoke, and receive help to quit smoking *(60).*

- In households with a single room and joint families, temporary partitions with old cloth, bedsheets or curtains can be created to ensure privacy. In larger homes, the mother can have a dedicated room for KMC.
- If the mother experiences discomfort due to abdominal pain, postpartum fatigue or weakness, she can be assisted to sit comfortably using pillows or soft clothes (Fig. 37). Alternating positions between semi-reclining and supine or using a binder while moving around can also help. Family members should be encouraged to support the mother and ensure she receives adequate food and rest (Fig. 38).
- If the mother prefers not to wear front-opening clothes, encourage her to wear a long garment over the shoulders to avoid exposure. Alternatively, she may wear loose clothing so she can place the newborn on her chest from underneath the clothing.
- Misconceptions surrounding KMC may hinder its practice. These beliefs are often context-specific, and a root cause analysis may be necessary to understand their origins. Counselling should be culturally sensitive and aim to dispel harmful myths.

Box 17.

Night-time KMC at home and safe sleep recommendations

A concern raised by experts from high-income settings is the potential conflict between KMC at home and safe sleep guidelines, particularly regarding the continuation of KMC at home during the night or when the mother is sleeping. However, evidence suggests that preterm or LBW newborns who receive KMC at home including night-time KMC have a significantly lower neonatal mortality compared with those who receive conventional care.

In a community-initiated KMC trial, LBW newborns were encouraged to maintain skin-to-skin contact as much as possible, including at night, and ideally for 24 hours a day. The intervention group achieved a mean KMC duration of 11.5 hours, which led to a 30% reduction in the mortality rate, suggesting that practising KMC at home can reduce neonatal mortality *(2)*.

The 'Immediate' KMC trial found that LBW newborns who received immediate KMC had a lower incidence of sudden deaths compared with those receiving conventional care (1.0% vs 1.3%) during their hospital stay, although the difference was not statistically significant. Additionally, post-discharge neonatal mortality was lower in the intervention arm compared to the comparison arm, even though KMC was continued at home including at night, in both groups, with an average of 8 hours of skin-to-skin contact per day (interquartile range: 5–14 hours in the intervention group and 5–13 hours in the comparison group) (personal communication with Dr Harish Chellani, 10 March 2025). These results offer reassurance that KMC is unlikely to increase the risk of sudden death when practised at home even at night.

While it is important to ensure the newborn's sleeping arrangements are safe, the evidence supports that the benefits of KMC – particularly its role in reducing neonatal mortality – outweigh concerns about its potential conflict with safe sleep practices.

Fig. 38. Additional caregivers supporting KMC at home

Father supports the mother with household tasks while she continues KMC

Grandmother provides skin-to-skin contact while the family enjoys time together at home

A father holds the newborn in skin-to-skin contact, allowing the mother to rest

- The mother may be able to manage household chores using an appropriate binder that securely supports the newborn in the KMC position, but other family members should be encouraged to help relieve the mother of household chores and practise skin-to-skin contact themselves. Their support can ensure the mother is able to focus on KMC and rest. Mothers should be encouraged to pursue non-strenuous routine activities while practising KMC at home (Fig. 39).
- In some settings, the birth of a preterm or LBW newborn can be stigmatizing. In such cases, KMC may be viewed as socially inappropriate. The parents should be counselled on how to navigate these societal challenges.

Fig. 39. Mothers continue providing KMC to their newborns at home


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While engaging in light household tasks


© Picturing Health / Tom Gibb


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While engaging with visitors or friends

5.4 Monitoring and follow-up

Close follow-up is a critical component of KMC. Evidence-based WHO guidelines on follow-up care for preterm or LBW newborns are still in development, but it is desirable that small and/or sick newborns receive additional visits beyond those typically recommended for healthy, term newborns. The timing, frequency and content of postnatal care should be customized to address the specific health needs and outcomes of both the mother and newborn, in line with country-specific protocols. As an example, Colombia has established a dedicated outpatient follow-up system for preterm or LBW newborns extending to one year of corrected gestational age (*61*).

In general, preterm or LBW newborns should be followed closely until they reach 40 weeks corrected gestational age or a weight of 2500 g. After this stage, follow-up visits may occur every two to four weeks until the newborn reaches a corrected age of three months. Subsequently, visits can be scheduled every three months during the first year.

The content of a typical follow-up visit is summarized in Table 6. A newborn should have adequate weight gain, approximately 15–20 g/kg/day *(62)*. If the newborn is not gaining weight or requires more intensive monitoring – such as in the case of small and/or sick newborns, including those receiving KMC – more frequent visits should be arranged. These visits are essential to assess recovery, feeding and weight gain, and to monitor health and neurodevelopmental progress. Some newborns may need specialized follow-up care, such as appointments with specialists (e.g. ophthalmology, neurology, cardiology, surgery) or allied health professionals (e.g. nutrition, speech therapy, physiotherapy, occupational therapy, audiology). It is important to identify the appropriate services available in the country and to link parents to these services as necessary. An inclusive programme integrating all services and allowing parents a single trip is ideal.

The content of the follow-up visit may vary based on the newborn's condition, including growth, presence or risk of illness, ability to feed, and the mother's confidence, knowledge and skills in care provision, including KMC. The following should be assessed at each follow-up visit:

- Ask about and look for any signs of illness, such as fever, respiratory distress, jaundice, feeding difficulties or lethargy. Conduct a complete physical examination. Follow local protocols for management of any issues identified, and consider referral to a higher facility if needed.
- Review any medicines or micronutrient supplements (e.g. caffeine, iron). Ensure correct dosing, monitor for side-effects, advise on the duration of use, and ensure the family has adequate supplies.
- Measure anthropometric parameters, plot an appropriate growth chart and help the mother understand the growth trajectory. If weight gain is inadequate, explore potential issues such as feeding or illness and provide necessary support.
- Assess the KMC position and duration. Monitor for signs of discomfort or refusal (e.g. wriggling, crying) and address any concerns. If the newborn accepts KMC, encourage continued practice and ensure the mother maintains a KMC chart for follow-up.
- Ask about the breastfeeding status (exclusive or mixed). If the mother is breastfeeding exclusively, praise the mother and reassure her about the adequacy of breast milk. If not, provide guidance on increasing breastfeeding, reducing formula or other fluids, and address any breastfeeding challenges.
- If the mother is not breastfeeding at all, review the use of formula and supplements being received by the newborn, and ensure their safety and adequacy. Check the family has a proper supply and is preparing the supplements correctly.

- Ensure the newborn is up to date with the national immunization schedule and administer any vaccinations due.
- Assess for tone, reflexes, posture, movement, function of the cranial nerves, development and behaviour using standardized tools. Address any parental concerns. Specialized investigations, such as screening for retinopathy of prematurity and cranial ultrasound, should be conducted according to national protocols.
- Ask the mother about any personal, household or social concerns, including her mental health, and provide appropriate support or referral to community resources if needed. Provide counselling on feeding, hygiene and KMC.
- Encourage the mother to continue follow-up childcare visits as required.

Table 6. Follow-up visit checklist

Area	Frequency	Details
History and complete newborn clinical examination	Every visit	Ask for any problems, review supplements and medicines, conduct complete clinical examination and address any issues identified
Growth monitoring/ anthropometry	Every visit	Measure weight, length and head circumference Plot on appropriate growth chart Manage inadequate weight gain
KMC (or breastfeeding if newborn is no longer in KMC)	Every visit	Assess the KMC position and duration Assess and observe breastfeeding if required, and provide required support
Counselling for maternal and newborn care	Every visit	Provide counselling on feeding, hygiene and KMC Address any maternal concerns
Neurological screening	Corrected gestational age of 40 weeks	Assess for tone, reflexes, posture, movement, function of cranial nerves and behaviour Address any parental concerns
Evaluation for retinopathy of prematurity	As per country-specific protocols	Screening should be conducted by a specialist Telehealth may be an option for follow-up where feasible
Cranial ultrasound	As per country-specific protocols	Perform cranial ultrasound to assess for intracranial haemorrhage or other abnormalities
Hearing screening	From the corrected gestational age of 40 weeks to 1 month of age	Automated *auditory* brainstem response preferred, especially for newborns required to stay in newborn care units
Immunizations	As per WHO or national schedule	Follow WHO or national immunization schedule

Persson Pettersen, at one week old, tube feeding. Persson was born nine weeks preterm, had immediate and continuous KMC for seven consecutive days without interruption, parents taking turns and doing all the care with support from staff
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Annexes

Annex 1. Breastfeeding positions

Breastfeeding position	Description
Semi-reclining/laid-back position (biological nurturing)  Mother breastfeeding the newborn in semi-reclining/ laid-back position	Used during KMC The mother is semi-reclined, and the newborn is fully supported on the mother's body The position encourages the newborn to root, open their mouth and self-attach, providing a calming and natural breastfeeding experience
Cross-cradle hold  Mother breastfeeding the newborn in cross-cradle hold	The mother supports the newborn's neck and shoulders in the palm of her opposite hand, with her fingers supporting the newborn's neck and shoulders The mother uses her free hand to gently hold her breast with the C-hold, shaping it for easier latch The mother positions the newborn's nose level with her nipple, and guides the newborn's mouth to her breast This position provides the mother with some control, especially for a newborn who was able to self-attach in the laid-back position

Breastfeeding position	Description
Under-arm hold  Mother feeding the newborn using under-arm hold	The newborn is positioned lying on their side, with their head at the mother's breast level and their body tucked under the mother's arm The mother positions the newborn's body along her side, tucked under her arm, with the newborn's body and feet close to her back The mother supports the newborn's neck and shoulders in the palm of her hand, ensuring the newborn's mouth faces her breast; she uses her other hand to support her breast The mother positions the newborn's nose level with her nipple, encouraging the newborn to open wide, and guides the newborn's mouth to her breast This position is ideal for twins and after caesarean birth because it reduces pressure on the abdomen; it also provides good control for newborns that have been unable to self-attach

Breastfeeding position	Description
Sitting position with 'dancer' handhold   Mother breastfeeding the newborn in sitting position with dancer handhold	The mother sits upright or slightly reclined, with the newborn in her lap facing her With her thumb on top of the breast and fingers below, the mother shapes her breast into a C or U to guide the newborn's latch The mother positions the newborn's mouth opposite her nipple and brings the newborn to her breast The mother can use pillows to raise the newborn to the level of her breast, with the nose directly opposite the nipple This position provides the mother with excellent control over the newborn's head and ensures a deep, effective latch; it can be used for newborns and older newborns

Breastfeeding position	Description
Cradle hold  Mother breastfeeding the newborn in cradle hold	The newborn's body is held across the mother's body The mother positions the newborn with the newborn's head resting on the lower part of her arm facing the mother's body The mother uses her opposite hand to support her breast The mother positions the newborn's nose level with her nipple, encourages the newborn to open wide and guides the newborn's mouth to her breast This is a widely used position that may be easier to use as the mother and newborn become more used to breastfeeding

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Annex 2. Growth monitoring and guidance on management of poor weight gain

The growth of all preterm or LBW newborns should be monitored regularly to assess nutritional status and adequacy of feeding and identify inadequate weight gain. In health facilities, preterm or LBW newborns should be weighed daily. The length and head circumference should be recorded weekly to ensure they meet adequate growth targets to support optimal neurological and physical development. In general, preterm or LBW newborns should show a weight gain of approximately 15–20 g/kg/day and head circumference gain of 1 cm/week *(1)*.

Growth velocity varies by gestation and postnatal age. Using a growth chart is a simple but effective way to monitor growth (Box A1). Weekly plotting of the newborn's weight and head circumference on the growth chart allows growth to be compared with a reference standard and helps in the early identification of growth faltering. Two types of growth chart are commonly used for growth monitoring for preterm or LBW newborns:

- For preterm newborns, postnatal growth charts can be used (e.g. Fenton charts until 50 weeks or intergrowth charts until 64 weeks postmenstrual age) *(2,3)*, after which use of the WHO child growth standards is appropriate.
- For term LBW newborns, WHO growth charts may be used *(4)*.

Box A1.

Growth monitoring in preterm or LBW newborns

- Weigh the newborn once a day. More frequent weighing may upset the newborn and cause the mother anxiety and is not required.
- Weigh the newborn naked, with the same calibrated digital weighing scales (ideally with an accuracy of ±5 g).
- To avoid cooling the newborn, place a clean warm towel on the scale and weigh in a warm environment.
- Measure the newborn's length and head circumference weekly until discharge from the health facility.
- Plot the growth parameters on an appropriate postnatal growth chart.

Inadequate weight gain is a common problem in LBW newborns. It often appears in the health facility and continues after discharge, especially in the absence of close follow-up, resulting in failure to thrive, stunting and wasting in the first year of life.

Common causes of inadequate weight gain

- Inadequate intake, often due to lack of adequate breastfeeding support, is the most common cause of inadequate weight gain:
  - In breast-fed newborns, improper positioning or attachment, less frequent breastfeeding, not feeding in the night hours, removing the newborn from the breast prematurely, and inappropriately limiting intake are common reasons for inadequate intake.
  - For newborns on spoon or cup feeding, reasons for inadequate intake include using an incorrect method of feeding (e.g. leading to excessive spillage), incorrect measurement or calculation, infrequent feeding, and underestimation of needs.
- The newborn's caloric needs increase with illness, hypothermia or cold stress, bronchopulmonary dysplasia, and medicines such as corticosteroids.
- Underlying conditions can contribute to inadequate weight gain, including anaemia (which can be mitigated through delayed cord clamping), hyponatraemia, late metabolic acidosis, late-onset sepsis, feed intolerance and gastro-oesophageal reflux.

Managing inadequate weight gain

- Counsel the mother and provide adequate support for breastfeeding. Assess positioning and attachment, and manage sore nipples and attachment problems.
- Explain the frequency and timing of feeding, including the importance of night feeds. Encourage the mother to feed the newborn at least every three hours and offer breastfeeds between these times if the newborn signals hunger. A timetable for the mother to fill in the timing and amount of feeding can help to ensure frequent feeding.
- Encourage expressed breast milk to be given by tube, spoon or cup feeding after breastfeeding. This is helpful for preterm newborns who may tire easily when sucking from the breast.
- Observe how the mother or additional caregiver gives feeds, noting the technique and amount of spillage. Follow this with a practical demonstration of the correct methods for expression of milk and feeding.
- Support the mother to increase her milk production.
- Support the newborn to achieve adequate milk transfer. Newborns requiring increased nutritional input for increased weight gain should be encouraged to feed at both breasts to access high milk flow and increased volumes. Use breast compression to encourage the newborn to continue to suckle actively at the breast. When the suckling activity decreases despite breast compressions, the newborn should be offered the next breast. If the mother feels the breasts empty quickly, she may need to switch sides more than once during feeding.
- Increase the duration of KMC.
- Manage underlying conditions such as anaemia, infection and feed intolerance. If breast milk is not available, nutrient-enriched preterm formula may be considered for very preterm or very LBW newborns.
- If these measures are not successful in addressing inadequate weight gains, additional tests may be required to better understand the reasons for failure to thrive.

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Annex 3. WHO conditional recommendations on micronutrient supplementation

- Multicomponent fortification of human milk is not routinely recommended for all preterm or LBW newborns, but may be considered for very preterm (gestational age less than 32 weeks) or very LBW newborns (birth weight less than 1.5 kg) who are fed mother's own milk or donor human milk. Initiation and duration of fortification should be based on clinical judgement **(conditional recommendation, low- to moderate-certainty evidence)**.
- Enteral zinc supplementation (a daily dose of 1–3 mg/kg per day of elemental zinc) may be considered for human milk-fed preterm or LBW newborns who are not receiving zinc from another source **(conditional recommendation, low-certainty evidence)**.
- Enteral vitamin D supplementation (daily dose of 400–800 IU, when enteral feeds are well established) may be considered for human-milk-fed preterm or low-birth-weight newborns who are not receiving vitamin D from another source **(conditional recommendation, low-certainty evidence)**.
- Enteral vitamin A supplementation (daily dose of 1000–5000 IU may be initiated when enteral feeds are well established) may be considered for human-milk-fed very preterm or very LBW newborns who are not receiving vitamin A from another source **(conditional recommendation, low-certainty evidence)**.

Reference

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Annex 4. Sample KMC monitoring forms

a. KMC daily recording chart for use by mothers or additional caregivers providing KMC

Date: _____

Mother's Name: _____

Newborn ID: _____

Time	Skin-to-skin contact with mother (minutes)	Skin-to-skin contact with additional caregiver (minutes)	Newborn put to breast in this hour (yes/no)	Newborn provided expressed breast milk in this hour (yes/no)
08:00–09:00				
09:00–10:00				
10:00–11:00				
11:00–12:00				
12:00–13:00				
13:00–14:00				
14:00–15:00				
15:00–16:00				
16:00–17:00				
17:00–18:00				
18:00–19:00				
19:00–20:00				
Total for last 12 h period[a]				

Time	Skin-to-skin contact with mother (minutes)	Skin-to-skin contact with additional caregiver (minutes)	Newborn put to breast in this hour (yes/no)	Newborn provided expressed breast milk in this hour (yes/no)
20:00–21:00				
21:00–22:00				
22:00–23:00				
23:00–00:00				
00:00–01:00				
0100–02:00				
02:00–03:00				
03:00–04:00				
04:00–05:00				
05:00–06:00				
06:00–07:00				
07:00–08:00				
Total for last 12 h period[a]				

[a] The duration of skin-to-skin contact and the frequency of breast milk feeds can be summed at the end of every 12 hours or each 6–8 hour shift and recorded in the clinical case notes or registers. A zero should be recorded, rather than leaving the row blank, for periods when there is a break in KMC for more than an hour.

b. KMC monitoring chart for health workers

Newborn ID: _____

Sex: _____

Date of birth: _____

Birth weight: _____

Weight at KMC initiation: _____

Date of KMC initiation: _____

	Date (DD/MM/YYYY)	Local time	Temperature (°C)	Weight (g)	Skin-to-skin contact duration (hours)	Number of breastfeeds or breast milk feeds
Day 1		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 2		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 3		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 4		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 5		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 6		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				

	Date (DD/MM/YYYY)	Local time	Temperature (°C)	Weight (g)	Skin-to-skin contact duration (hours)	Number of breastfeeds or breast milk feeds
Day 7		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				
Day 8		00:00–06:00				
		06:00–12:00				
		12:00–18:00				
		18:00–00:00				

The duration of skin-to-skin contact and frequency of breast milk feeds are best recorded from the mother's or additional caregiver's hourly record sheet. In busy settings, especially when the mother or caregiver cannot read or write, on-duty staff may also use their own observations or information recalled by the mother/caregiver at 6–8 hourly intervals.

c. KMC unit monthly reporting format

Facility name: _____

Reporting period: from (DD/MM/YYYY) to (DD/MM/YYYY): _____

Information completed by:

- Name: _____
- Designation: _____
- Contact number: _____

Section 1: Individual newborn records

SN	Newborn ID and details *(parents' name, address, contact)*	Date and time of birth	Birth weight and gestational age	Place of birth *(Inborn/ outborn)*	Date and time of admission to KMC unit	Weight at admission to KMC unit	Date and time of SSC initiation	Date and time of initiation of breast milk feeding	If KMC not started – reason	Outcome *(discharged / referred / DOR / LAMA)*	Date of outcome	Reason for referral/ DOR/ LAMA	Duration of SSC in 24 hrs before outcome	Type of feeding in 24 hrs before outcome *(EBF / mixed / formula)*	Breastfeeding frequency in 24 hrs before outcome	If EBF = No – reason	Weight at outcome
1																	
2																	
3																	

Section 2: Monthly summary

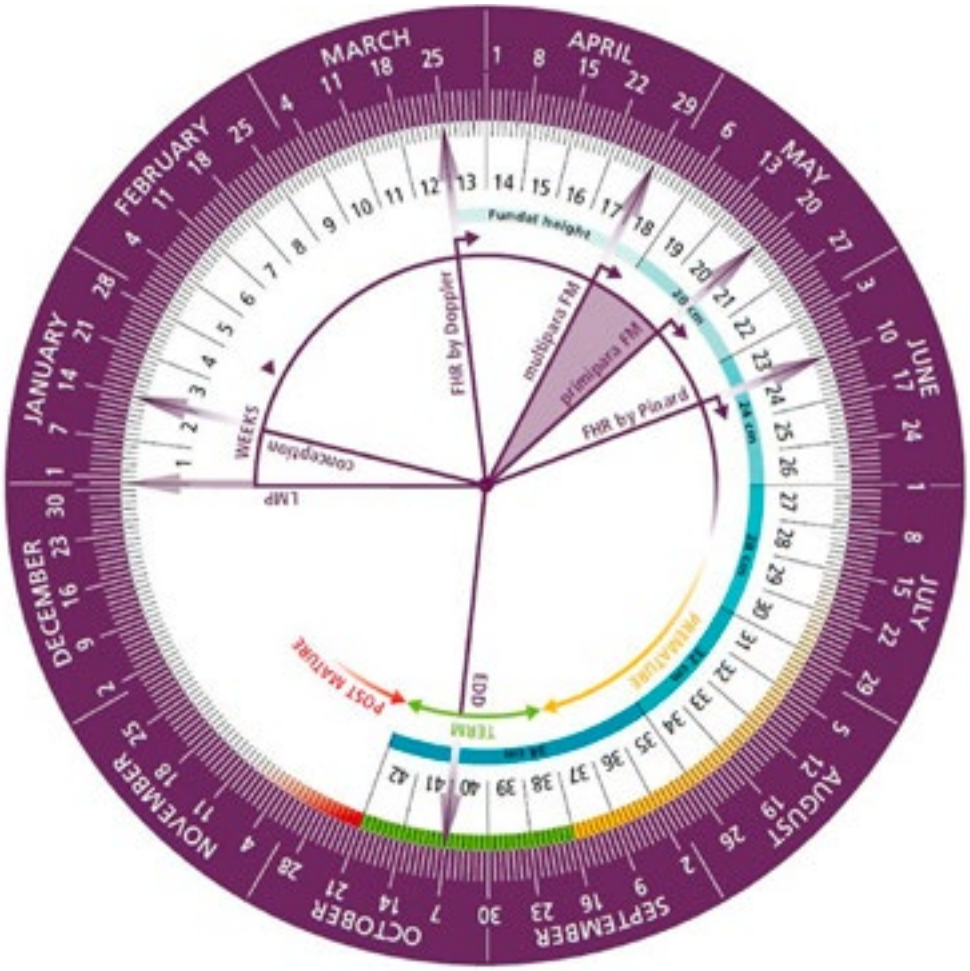
- Total live births: _____
- Live births – preterm or LBW (GA<37 weeks or BW<2500 g)
  - Inborn: _____
  - Outborn: _____
- Preterm or LBW infants admitted to KMC unit
  - Inborn: _____
  - Outborn: _____
- Preterm or LBW infants initiated on KMC: _____
- Preterm or LBW infants with >8 hrs/day SSC before discharge: _____
- Preterm or LBW infants exclusively breastfed at discharge: _____
- Preterm or LBW infants not started on KMC (with reasons): _____

Additional indicators (optional):

- Average duration of SSC in 24 hours before discharge: _____

Annex 5. How to use a pregnancy wheel to determine if a newborn is preterm

Fig. A1 Pregnancy wheel



Steps:

Find the first day of the woman's last menstrual period (LMP on wheel): Locate this date on the pregnancy wheel (Fig. A1).

Align the marker: Rotate the wheel so that the arrow or indicator points to the date of the LMP.

Read the estimated due date (EDD): The wheel will show the estimated due date, usually 40 weeks from the first day of the LMP. If the newborn is born before this date, they may be considered preterm.

Pregnancy wheels are also available online or as mobile apps and can be used by community health workers if they have access to a smartphone.

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