



KANGAROO MOTHER CARE & OPTIMAL FEEDING OF LOW BIRTH WEIGHT INFANTS

Operational Guidelines | September 2014

For Programme Managers & Service Providers



Child Health Division

Ministry of Health and Family Welfare, Government of India



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FOREWORD

Birth Weight is a reliable and sensitive indicator for predicting the immediate and long term outcome of a newborn. Low Birth Weight (LBW) is a challenging multifaceted public health problem because it is associated with increased risk of morbidity and mortality in infants. Low Birth Weight newborns are four times more likely to die from common childhood diseases in the first year of life, than their normal counterpart. The public health significance of Low Birth Weight is accentuated by its association with mental retardation, specialized institutional care and intensive care units. There is also emerging evidence that Low Birth Weight neonates are more prone to Non-Communicable Diseases (NCDs) like Diabetes Mellitus, Hypertension and Coronary Artery Disease in later life.

Kangaroo Mother Care(KMC) and optimal feeding in Low Birth Weight infants are evidence based cost-effective interventions which, when upscaled and implemented across all facilities can save up to half a million newborns. Despite the KMC network having been established in India in 1990s, this simple technique is still not being practiced universally across the country. "Kangaroo Mother Care and Optimal Feeding of Low Birth Weight Infants" guidelines have been designed to emphasize the implementation of KMC in SNCUs and Medical Colleges on priority.

This guideline I am sure will help the service providers and programme managers alike to implement KMC and optimal feeding and will go a long way in improving the survival and development of low birth infants.


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PREFACE

Preterm births and intra-uterine growth retardation lead to low birth weight (LBW), which is an important indirect cause of neonatal deaths. The global prevalence of LBW is 15.5% and in India, 27% of all live births are LBW.

Kangaroo Mother Care (KMC) is a simple, cost-effective way of caring for low birth weight infants and has been included in many guidelines and training modules released by Government of India. It has been observed that despite undergoing training, service providers are not adept at providing Kangaroo Mother Care for LBW newborns. It was therefore the need of the hour to have an implementation guideline for rolling out KMC at the facility level.

These guidelines will give a clear idea to service providers on what exactly KMC is and how KMC techniques can be implemented when caring for low birth weight infants. I am confident that the guidelines will also be used by programme managers and health facility managers to establish KMC units across the country and help in reducing neonatal mortality.

(Dr. Rakesh Kumar)



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ACKNOWLEDGEMENT

In India, Low Birth Weight (LBW) is an important underlying cause of neonatal mortality. Experience from world over shows that appropriate care of LBW infants, which encompasses feeding, temperature maintenance, hygienic care, early detection of infections and treatment of complications can substantially reduce mortality rates.

“Kangaroo mother care”-a simple and cost effective technique was introduced in India in 1994 and KMC Network of India was also established. Though this intervention finds a place in various training modules it is not being implemented across the facilities in the country.

Child Health Division, Ministry of Health & Family Welfare (MOHFW), Govt. of India has taken a decision to implement Kangaroo Mother Care at facility level. Operational Guidelines for “Kangaroo Mother Care and Optimal Feeding of Low birth Weight infants” is a step towards this direction.

Dr. P.K. Prabhakar, Deputy Commissioner, MOHFW coordinated the development of these guidelines and led the team of Child Health Division and experts from various institutions and development partners. Contribution of all experts is gratefully acknowledged. Special thanks are due to Dr. Vinod K. Paul, Dr. A. Deorari, Dr. Rekha Udani, Dr. Sushma Nangia and Dr. Sadhana Mehta for reviewing the draft and helping in finalizing the guidelines. Contribution of USAID-MCHIP in coordinating the development and printing of this guideline is also acknowledged.

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ACRONYMS

AIIMS	All India Institute of Medical Sciences	KMC	Kangaroo Mother Care
ANM	Auxiliary Nurse & Midwife	KMCU	Kangaroo Mother Care Unit
ASHA	Accredited Social Health Activist	KSCH	Kalawati Saran Children's hospital
AV aids	Audio Visual aids	LBW	Low Birth weight
BERA	Brainstem evoked response audiometry	LHMC	Lady Hardinge Medical College
CC	Chest Circumference	MCH	Maternal and Child Health
DEIC	District Early Intervention Centre	MCHIP	Maternal and Child Health Integrated Program
FBNC	Facility Based Newborn Care	MEN	Minimal Enteral Nutrition
F-IMNCI	Facility based Integrated Management of Neonatal and Childhood Illnesses	NHM	National Health Mission
FOGSI	Federation of Obstetric and Gynaecological Societies of India	NICU	Newborn Intensive Care Unit
GNM	General Nursing and Midwifery	NNF	National Neonatology Forum
HBNC	Home Based Newborn Care	OAE	Otoacoustic Emissions
HC	Head Circumference	PMA	Post Menstrual Age
Hib	Haemophilus influenzae type B	PVL	Periventricular leukomalacia
IANN	Indian Association of Neonatal Nurses	RBSK	Rashtriya Bal Swasthya Karyakram
IAP	Indian Academy of Paediatrics	RCC	Regional Collaborative Centre
IM	Intramuscular	RMNCH+A	Reproductive, Maternal, Newborn, Child and Adolescent Health
IMS Act	Infant Milk Substitutes Act	SGA	Small for Gestational Age
IQ	Intelligence Quotient	SNCU	Sick Newborn Care Unit
JSSK	Janani Shishu Suraksha Karyakram	STS	Skin-to-Skin
KEM	King Edward Medical College	USAID	United States Agency for International Development
		WHO-CC	World Health Organization Collaborative Centre



INTRODUCTION

- KANGAROO MOTHER CARE (KMC)
- DEFINITIONS
- EVIDENCE FOR KMC
- PURPOSE OF THE GUIDELINES



INTRODUCTION

Introduction

Of the 20 million low birth weight infants born globally every year, about 8 million are in India. Over 80% of neonatal deaths occur among small infants - 65% are attributable to preterm infants and 19% to term-small for gestational age, (SGA) (Lawn Every Newborn Lancet Series 2014). India has the highest number of preterm births and also accounts for maximum number of neonatal deaths due to prematurity. Incidence of LBW in India is about 27% of total live births.

KANGAROO MOTHER CARE (KMC)

Kangaroo Mother Care is a low resource, evidence based, high impact intervention and standardised care for low birth weight infants which, like breastfeeding, should be part of routine care. It can prevent up to half of all deaths in infants weighing <2000g (Lawn et al, 2010).

DEFINITIONS

Kangaroo Mother Care (KMC) is a simple method of care for low birth weight infants that includes early and prolonged skin-to-skin contact with the mother (or a substitute caregiver) and exclusive and frequent breastfeeding. This natural form of human care

stabilizes body temperature, promotes breast feeding, prevents infection and other morbidities. This also leads to early discharge, better neurodevelopment and encourages bonding between mother and infant. KMC is initiated in the hospital and continued at home until the infant needs it and for optimum care a regular follow-up must be ensured.

Kangaroo mother care has following components:

1. Skin-to-skin contact
2. Exclusive breast feeding

However, KMC should not be confused with routine skin-to-skin care at birth. World Health Organization (WHO) recommends skin-to-skin care immediately after delivery for every newborn, irrespective of the birth weight to ensure warmth and early initiation of breast feeding in the delivery room KMC is meant for stable LBW infants and denotes a sustained, long-duration skin-to-skin contact.

Kangaroo is an animal found in Australia. She invariably delivers a premature baby. The premature, baby kangaroo stays in the pouch of her mother, where it gets warmth and exclusive breast feeding till it is mature enough to survive outside.

DURATION OF KMC

Short: 4 hours daily* **Extended:** 5-8 hours daily*
Long: 9-12 hours daily*

Continuous: More than 12 hours daily*

*Documented on two consecutive days or more prior to discharge.

Duration to be counted as cumulative completed hours during a 24 hour period.

Low birth weight (LBW) has been defined by the World Health organization (WHO) as weight at birth less than 2,500 grams which can be a consequence of preterm birth or due to small size for gestational age or both. Preterm is defined as born before 37 weeks completed and SGA is defined as weight for gestation less than 10th percentile of the gestation norm.

EVIDENCE FOR KMC

Evidence of the effectiveness and safety of KMC for clinically stable preterm newborns, is now formally established. In 2011, an updated Cochrane review (Conde-Agudelo, Diaz-Rossello, Belizan 2011) assessed 35 studies. This review demonstrated even more convincing results than the previous one published in 2008. Compared with conventional neonatal care, KMC was found to reduce:

- ◆ Mortality at discharge and at the latest follow-up,
- ◆ Severe infection/sepsis, nosocomial infections, lower respiratory tract disease,
- ◆ Hypothermia and length of hospital stay.

The 2011 review also revealed that KMC resulted in:

- ◆ Improved weight, length and head circumference,
- ◆ Increased breastfeeding rates,

- ◆ Better mother-infant bonding and maternal satisfaction with the method of care, as compared with conventional methods

Above review included seven trials that assessed mortality at discharge or 40–41 weeks and reported a statistically significant reduction in the risk of mortality among KMC infants (3.4%), compared with 5.7% for infants receiving traditional care. **The review ultimately concluded that KMC should be used for all stabilized LBW infants.**

There is now sufficient evidence to recommend the routine use of KMC for all low birth weight infants. However in our country newborn infants weighing less than 2,000 grams should be started on KMC, on priority in view of the high burden of LBW infants.

Newborn infants weighing less than 2000 grams should be started on KMC on priority.

Other benefits

KMC is associated with reduced incidence of severe illness including pneumonia during infancy. In most of the studies KMC has been found to be more effective than incubator care for stable newborns in: providing adequate thermal care, reducing nosocomial infections, improving exclusive breastfeeding and weight gain, and fostering greater maternal and family involvement in care—all at a lower cost than incubator care.

KMC satisfies all five senses of the infant. The infant feels the mother's warmth through skin-to-skin contact (touch), listens to her voice and heartbeat (hearing), sucks breast milk (taste) has eye contact with her (vision) and smells her odor (olfaction).

Management of LBW is covered in various training packages under NHM (including, Facility-Based

HISTORY OF KMC

- A team of pediatricians started KMC in Instituto Materno Infantil (IMI) in Bogota, Colombia in 1978.
- In 2003, WHO formally endorsed KMC and published KMC practice guidelines.
- KMC was introduced in India, in 1994 in BJ Medical College Hospital, Ahmedabad. This was followed by experiences in KEM Mumbai and at the All India Institute Medical Sciences (AIIMS).
- A KMC India Network (www.kmcindia.org) comprising six institutions was started in 2003.

Newborn Care, Facility-IMNCI) with mention of KMC. Yet the practice of KMC in public health facilities (including SNCUs and medical colleges) as also in private hospitals remains inadequate. A recent assessment of KMC in selected tertiary care hospitals in a few states in the western and southern parts of India revealed many bottlenecks in implementing KMC including:

1. Lack of institutionalization
2. No ownership of KMC even in facilities providing care
3. Inadequate continuum of KMC after discharge

The study recommended the need for strengthening training of service providers, appropriate job aids and IEC materials, and appropriate system for follow-up of LBW infants.

Situation analysis also indicates that KMC and feeding go hand-in-hand for LBW infants as they

have special nutritional needs. Evidence based principles exist which highlight the importance of 'breast milk feeding' and practical aspects of 'enabling LBW infants achieve optimum growth' through optimum feeding. Therefore there was a need to develop integrated guidelines for implementing KMC and feeding of low birth weight infants.

PURPOSE OF THE GUIDELINES

The purpose of the guidelines is to:

- ◆ Present evidence based technical protocols to be observed at the health facilities for KMC and feeding of LBW infants.
- ◆ Provide appropriate guidance on:
 - Operationalization of KMC and LBW feeding practices at different levels of health facilities.
 - Choice of initial feeding method, progression of oral feeds, and nutritional supplementation.

The guidelines discuss not only various protocols, but also the essential skills and monitoring involved. It has been prepared for health professionals providing care to LBW and preterm infants in health facilities. Practical instructions (or protocols) may be adapted to local norms for different categories of health workers available in various settings. The guidelines are also aimed at decision-makers and planners at various levels to help them understand the prerequisites to implement KMC, optimal feeding and follow-up of LBW infants. These should also be incorporated into pre-service and in-service educational packages on neonatal care.



KANGAROO MOTHER CARE IMPLEMENTATION

- What is required for implementing KMC
- Who can provide KMC?
- How to Provide KMC
 - ◆ Counselling
 - ◆ Clothing
 - ◆ KMC Position
- Duration of KMC
- Monitoring of the infant
- Feeding during KMC
- Special situations
- Discharge from hospital and follow-up
 - ◆ Follow-up
 - Frequency of visits
- Don'ts of Kangaroo Mother Care



KANGAROO MOTHER CARE IMPLEMENTATION

Even though KMC is simple, it needs to be initiated at the hospital under skilled supervision. The mother needs guidance by a health professional to provide KMC and optimally breastfeed the LBW infant, starting at the facility and continuing on her own at home. Once the mother goes home, it is important that the continuum of KMC is maintained; community health workers (ASHAs, ANMs, AWWs) should ensure that the mother continues to provide kangaroo care at home. It is equally important that they should facilitate follow-up visits to the facility for review and problem solving as this support is crucial for the infant's health after discharge.

WHAT IS REQUIRED FOR IMPLEMENTING KMC?

A. Infrastructure

Dedicated space near Special Newborn Care Unit (SNCU), post-natal ward or neonatal ward/ NBSU which is furnished with comfortable reclining chairs & cots, provides privacy for expression of breast milk and is equipped with storage facility for expressed breast milk.

B. Human resources:

The availability of adequate number of trained and willing health service providers for 24x7 services is

most crucial for assisting mothers in KMC practice and LBW feeding.

C. IEC

Ensure adequate IEC material, including video films on KMC in local language for mothers, families and community.

Counselling of the mothers, fathers and relatives by service providers is catalytic in ensuring KMC practice during their stay at the hospital and after discharge so that they can continue to practice KMC till the infant requires it. Community awareness activities should be conducted to maximize the benefits of KMC and breastfeeding.

Nurses and other service providers learn to appreciate KMC once they observe the health benefits to the infant and satisfaction of the mother.

D. Which infants should be provided KMC

Though all LBW infants should be provided KMC but considering the huge burden at facilities, priority must be given to infants with birth weight less than 2000 grams.

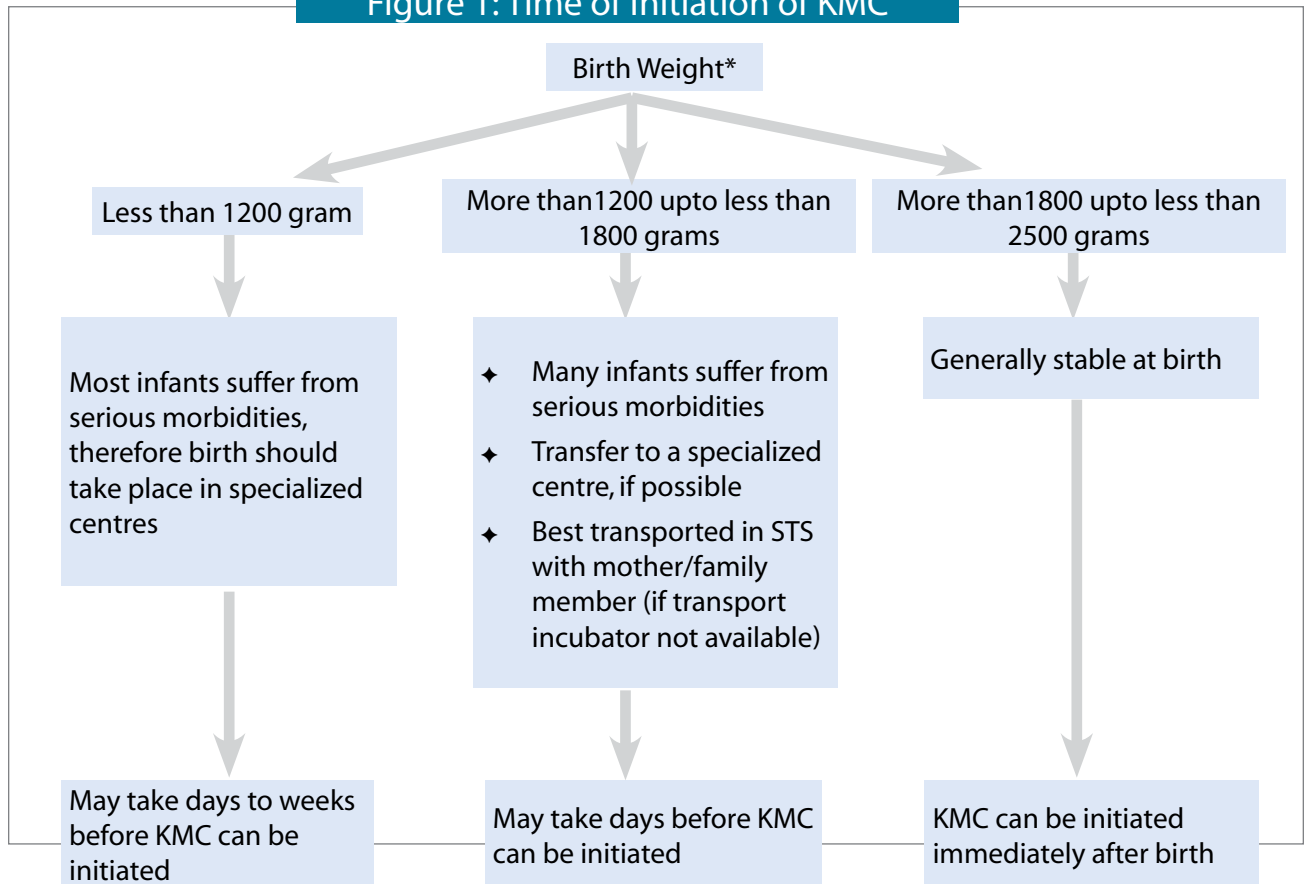
The timing of initiation of KMC depends on the birth weight and stability of the infant.

1. **Birth weight more than 1,800 grams and less than 2500 g:** These infants are generally stable at birth. Therefore, in most such cases KMC can be initiated soon after birth in the postnatal ward. The neonate weighing less than 2000g should be accorded priority for initiation of KMC considering the huge burden of LBW infants in the country.
2. **Birth weight more than 1,200g and less than 1800 g:** Many infants of this group have significant problems in the neonatal period. It might take a few days before KMC can be initiated. Such infants may

need care in a Special Newborn Care Unit (SNCU) or a Newborn Intensive Care Unit (NICU). Intermittent KMC can be given to a hemodynamically stable infant receiving IV fluids, antibiotics and oxygen. KMC should be practiced under medical supervision. The duration may be gradually increased and thereafter the infant may be transferred to a dedicated KMC ward.

3. **Birth weight less than 1,200 g:** These infants frequently experience serious prematurity related morbidity often starting soon after birth. It may take days to weeks before the infant's condition allows initiation of KMC. Duration of KMC should be gradually increased based on the tolerance of infant.

Figure 1: Time of Initiation of KMC



* Cut-off birth weight for KMC has been based on Operational Guideline of Facility Based Newborn Care

WHO CAN PROVIDE KMC?

KMC can be provided by mothers, fathers and other adult family members. The KMC provider should be willing, in good health, free from serious illness and should maintain basic standards of hygiene such as hand washing, daily bath, clipped fingernails, tied up hair and clean clothes. It is recommended that jewellery, watches and sacred threads must be removed as they may be a barrier to maintain hygiene and might cause injury to the newborn.

HOW TO PROVIDE KMC?

Counselling

Effective counselling for the initiation of KMC is a prerequisite to overcome socio-cultural barriers and anxiety regarding handling a LBW infant both by the mother and other care providers.

When the infant is ready for KMC, the first counselling session should be organized at a time convenient to the mother. The first few sessions are important and require extended interaction to develop a rapport with the mother and to alleviate any fear. KMC procedure should be demonstrated to her explaining correct position in a caring, gentle manner and with patience. Her queries should be answered to allay her anxieties.

Encourage her to bring her mother/mother-in-law, husband or any other member of the family. It helps in building a positive attitude of the family and ensuring family support to the mother which is particularly crucial for post-discharge home-based KMC. It is helpful that the mother and family members starting KMC interact with someone already practicing KMC for her infant.

A supportive family is a very important pre requisite for successful KMC.

Clothing

Mother:

KMC can be provided using any front-open, light dress as per the local culture. KMC works well with sari-blouse, gown or shawl. A suitable apparel like Kangaroo bag, baby bag, sari, binder that can retain the infant for an extended period can be adapted locally.

It is not mandatory to have any special dress, garment or binder for KMC. It can be provided using any clothing that is acceptable to the mother and the family.

Infant:

The infant should be dressed in cap, socks, disposable diapers and front-open sleeveless shirt or 'jhabala' made of a soft natural fabric like cotton.

Figure 1: Examples of KMC supporter

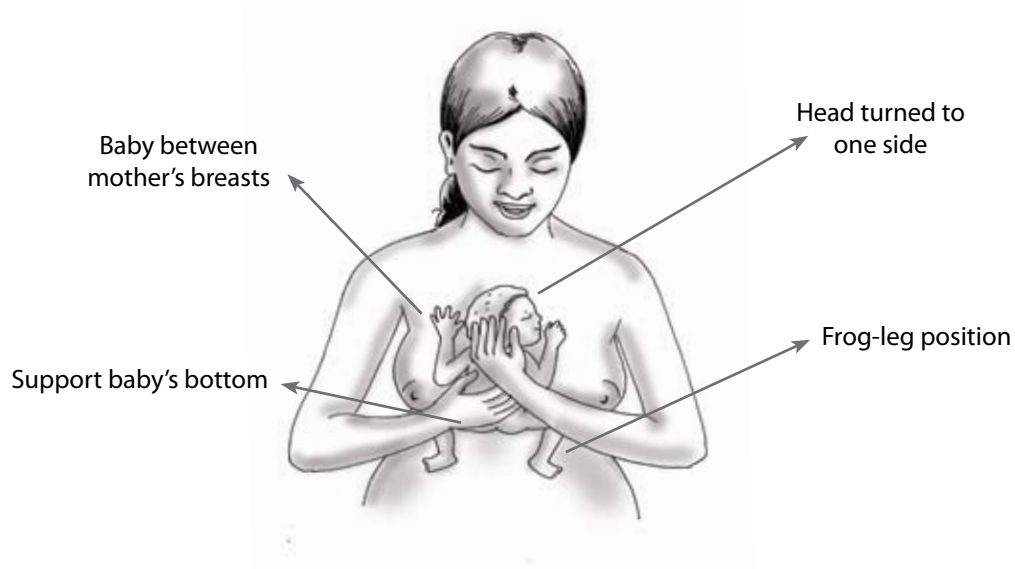


Figure 2: Example of clothing for infants



KMC Position

Figure 3: How to hold the infant in KMC



Baby:

- ◆ The infant should be placed between the mother's breasts in an upright position.
- ◆ The head should be turned to one side and in a slightly extended position. This slightly extended head position keeps the air way open and allows eye to eye contact between the mother and her infant.

The hips should be flexed and abducted in a "frog" position; the arms should also be flexed.

- ◆ The infant's abdomen should be at the level of the mother's epigastrium. Mother's breathing stimulates the infant, thus reducing the occurrence of apnoea.
- ◆ Support the infant from the bottom with a sling/binder.

Figure 4: How to handle the baby



Health provider should help the mother initiate KMC by assisting in positioning the infant and explaining how to handle the infant during KMC. Repeated training helps the mother overcome the fear of handling her newborn and improves her skill related to KMC.

Mother:

- ◆ A semi-reclining position (40°-45°) is to be adopted while sleeping. This can be achieved with the help of 3-4 pillows on the hospital bed or special semi-reclining chairs.

Figure 5: Examples of various support methods for KMC



The mother carrying an infant in the KMC position can walk, stand, sit, or engage in different activities. If comfortable, the mother can sleep with the infant in kangaroo position in a reclined or semi-recumbent position

DURATION OF KMC

Minimum duration of a KMC session should be one hour because frequent handling may be stressful for the infant. The duration of each KMC session should be gradually increased for as long as the mother can comfortably provide KMC. The infants in KMC need to be removed from skin-to-skin contact only for changing diapers and clinical assessment according to hospital schedules.

MONITORING OF THE INFANT

- ◆ Infants receiving KMC should be monitored carefully especially during the initial stages to ensure that the infant's airway is clear, breathing is regular, colour is pink and s/he is maintaining temperature. All the above clinical observations and duration of KMC should be duly recorded in the newborn case-sheet being used in the unit.
- ◆ Mother should be trained to observe her infant for danger signs, like- hypothermia, respiratory problems, feeding difficulty, change in colour during KMC so that she can continue monitoring at home.

FEEDING DURING KMC

Feeding and nutrition strategies during the postnatal period are very important for ensuring optimum growth and development of LBW infants. The nutritional needs of infants with similar birth weight may vary depending upon whether the baby is appropriate for gestational age (AGA) or small for

gestational age (SGA). Initially, breastfeed is given at fixed intervals of two hours and not on demand, to ensure an adequate and assured minimal intake. The mother should be explained how to breastfeed while the infant is in KMC position. Holding the infant near the breast stimulates milk production. She may express milk while the infant is still in KMC position. (For details on feeding please see the next section on optimal feeding.)

SPECIAL SITUATIONS

There may be special situations where despite the newborn being sick KMC can be given with some precautions.

Sick LBW infants: KMC is recommended for stable LBW infants. However, it is beneficial even for sick LBW infants. In such cases kangaroo mother care may be given only under close and constant supervision in centres that are well versed with the practice of KMC. Hemodynamically stable preterm infants on prolonged ventilation or on CPAP can also be given KMC. Treating MO should use her/his judicious discretion on case-to-case basis.

Figure 6: Health provider explaining the KMC position to mother



Transport: Ideally, transport incubators with appropriate monitoring equipment are the best method to transport sick infants. However, in case they are not available, the best method to keep a preterm/LBW infant warm during transport after initial stabilisation is by continuous skin-to-skin contact with the mother/family member.

If some other family member is not available for KMC or KMC is not initiated: Ensure the baby is kept in warm room 25°C-28°C, adequately covered or if below 1800 grams not able to maintain normal temperature under a warmer.

DISCHARGE FROM HOSPITAL AND FOLLOW-UP

The standard policy of the unit for discharge from the hospital should be followed. Generally, the following criteria are accepted at most centres.

The infant is

- Stable and not on parenteral medication
- Maintaining temperature in mother's bed for 3 consecutive days at room temperature
- Gaining 15-20 grams per day for at least 3 consecutive days
- Accepting feeds directly from breast (preferable) or by spoon, paladai or cup

Usually, the infant's weight is around 1,500 to 1,600 grams at the time of discharge. Infants who are above 1,800 grams birth weight, do not require admission into a nursery/SNCU, are given KMC soon after birth and can be sent home once adequacy of breastfeeding is established.

At discharge, the mother and family members must be taught to ensure that the infant is nursed in a warm room and is breastfed (Given expressed milk using paladai or cup). They should be adequately told about hygiene, danger signs, follow-up visits, immunisation and prompt care seeking at a health facility.

KMC should be continued as long as required and baby and mother should not be discharged in a hurry.

At the time of discharge, the infant should be taken home in KMC position by the mother or relatives so as to encourage continued KMC at home.

At the time of discharge, the family should be counselled and linked to the ASHA worker of the village who shall provide home based care and follow-up to the baby (as per protocol).

Follow-up

Close follow-up is a fundamental prerequisite of KMC practice to make a regular assessment of growth, sensory functions, behaviour and neurodevelopment. During the follow-up visits anthropometric measurements (e.g., weight, length, head circumference) of the infant should be recorded to monitor the growth. More frequent visits should be made if the infant is not growing well or if her/his condition demands. ASHA will continue to provide care to the infant under home based newborn care in the community, following discharge.

First Follow-up should be at one week, followed by fortnightly follow-ups till next two visits. Additional follow-up visits may be done until s/he reaches 40 weeks of post-conception age or achieves a weight of 2,500 grams.

If infant is receiving immunization at a facility where KMC services are available, a follow-up may be ensured.

- ◆ Detailed follow-up protocols are attached as annexure 3 as per the chapter 17 of the Training Module for Doctors and Nurses for FBNC.

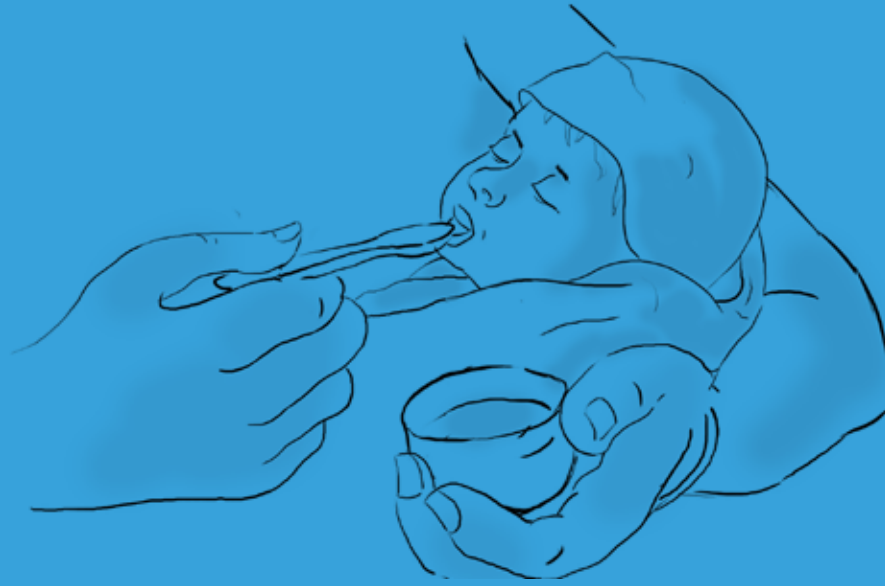
- ◆ Infants discharged on KMC should be followed up in the regular follow-up OPD of SNCUs and linkage with District Early Intervention Centre (DEIC) under RBSK for screening of neurodevelopmental morbidities should be established.
- ◆ SNCU discharged infants are to be followed up till one year while LBW infants are to be followed up at home for one year by ASHA as per HBNC guidelines

DON'TS OF KANGAROO MOTHER CARE

- ◆ Do not bathe till infant weighs 2,500 g, sponging may be done
- ◆ Do not handle infant too frequently
- ◆ Do not give bottle feed
- ◆ Do not allow infant to be in contact with sick people

When should KMC be discontinued?

Often an infant is taken off kangaroo mother care when gestation reaches term or the weight is around 2,500 grams. By this time the infant starts wriggling to show that he or she is uncomfortable, pulls out the limbs from the kangaroo garment and cries and fusses every time the mother tries to put the infant back in skin-to-skin contact. This is the time to wean the infant from KMC.



OPTIMAL FEEDING OF LOW BIRTH WEIGHT INFANTS

- What to feed the LBW infant?
 - ◆ Breastfeeding
- Alternative methods of feeding when direct breastfeeding is not possible
- Deciding the initial method of providing fluids and feeding
- Feeding progression
- How often and how much to feed?
- Special considerations for infants below 1200 grams
- Adequate weight gain



OPTIMAL FEEDING OF LOW BIRTH WEIGHT INFANTS

Low birth weight (LBW) infants need optimal nutrition during the neonatal period for proper growth and development. Appropriate feeding of low birth weight and very low birth weight infants improves their chances of survival and is important for their optimum growth and development.

Breast milk is the ideal food for all infants including those who are LBW. WHO recommends that all LBW infants, irrespective of their gestation be fed breast milk. The goal is to enable every LBW infant to receive feeding directly and exclusively from her/his mother's breast at the earliest.

However, many preterm infants have feeding difficulties initially because of

- ◆ Inability to coordinate suck, swallow and breathing
- ◆ Immature and sluggish gut and
- ◆ Systemic illness.

Full term small-for-gestational-age infants because of being weak or sick may also experience.

- ◆ Poor attachment and sucking effort on the breast
- ◆ Poor swallowing
- ◆ Easy tiredness (and hence poor intake)
- ◆ Vomiting, regurgitation or abdominal distension

Lower the birth weight, greater is the likelihood of feeding difficulties.

These infants may not be stable enough to tolerate enteral feeds and are therefore provided intravenous fluids till such time that enteral feeding can be established optimally. Direct feeding from the mother's breast may not be possible or may not be enough to fulfill the need in many others and in this situation, feeding may need to be provided by alternative feeding methods such as feeding tube, spoon, paladai or cup.

LBW infants who are able to breastfeed should be put to the breast as soon as possible after birth when they are clinically stable, and should be exclusively breastfed until six months of age.

Low-birth-weight infants, who are unable to take directly from the breast, should be fed by oro-gastric tube, feeding cup, paladai or spoon.

WHAT TO FEED THE LBW INFANT?

Breastfeeding

Mother's milk is best for LBW infants of all gestational ages. Breast milk and especially colostrum (the thick, yellowish milk which is produced in small quantities during the first few days after delivery)

best assures the survival and well-being of LBW infants.

Breast milk is specially adapted to the nutritional needs of LBW infants; for example, the breast milk of a mother who delivers a preterm LBW infant contains extra protein that is necessary for the normal growth of such an infant.

Breast milk is the ideal feed for all infants, including LBW infants

Breast milk provides many anti-infective factors, a vital component of the immune system of a newborn infant, and growth factors which help gut development. There is strong and consistent evidence that feeding mother's milk to LBW infants of any gestation is associated with lower incidence of infections and better long-term outcomes.

Every effort should be made to provide breast milk to LBW infants. This would require:

1. For stable infants
 - a. Placing infant in skin to skin contact with the mother immediately after delivery
 - b. Initiating breastfeeding within one hour
 - c. Initiating and providing Kangaroo Mother Care (KMC)
 - d. Offering breastfeeding frequently, approximately, every two hours, and on demand
 - e. Ensuring continued frequent feeding at night
 - f. Ensuring proper positioning and attachment
 - g. Managing breast/nipple problems such as retracted or cracked nipple, and breast engorgement
2. For unstable infants (with cardio-respiratory problems, temperature instability, abdominal

distension or acute serious illness such as asphyxia or sepsis; on life support)

- a. Offering expressed breast milk by alternate methods (described below)
- b. As the infant improves, putting her on the breast to stimulate lactation
- c. Initiating Kangaroo Mother Care (KMC) once the infant stabilizes

Another issue of paramount importance is to ensure optimum lactation in the mother who has a small infant. Because of the poor or no suck effort on the breast by the LBW infant (due to sickness, weakness or poor reflexes) and maternal anxiety, the breast milk output may remain low. Lactation inadequacy must be prevented and tackled through counselling. In addition, breast milk should be expressed frequently to provide expressed breast milk to the infant and to enhance milk output.

The best milk for LBW infants is mother's milk. All else is inferior.

Breastfeeding is contraindicated when the mother is receiving certain drugs like anti-neoplastic agents, immuno-suppressants, anti-thyroid drugs like thiouracil, amphetamines, gold salts, etc. Breastfeeding may be avoided when the mother is receiving following drugs- atropine, reserpine, and psychotropic drugs.

In case mother's milk is not available, then the choices in the order of preference are:

- ♦ **Expressed donor milk from other lactating mothers-** At times, breast milk output in the mother of the LBW infant may not be sufficient, especially in the first few days. Given the importance of breast milk to the infant, the use of breast milk obtained from other lactating women (donor milk) is recommended. Ideally, this should be

organized in places where breast milk bank is established. Proper breast milk bank ensures that donated milk is safe and healthy.

- ◆ **Formula milk-** When not enough breast milk is available to meet the needs of a LBW infant, formula milk may be given with **proper preparation and hygiene**. For infants below 1,500 grams birth weight, a preterm formula is preferred. The formula milk should be given under the guidance of a paediatrician. It should be in compliance with IMS act (Annexure 4).
- ◆ **Animal Milk-** Cow or buffalo milk are the **last choice** when all other options have been exhausted despite best efforts. Such milks are unsuitable and may be given with great caution without dilution with alternate methods of feeding.

There is NO place for bottle feeding in the care of infants

ALTERNATIVE METHODS OF FEEDING WHEN DIRECT BREASTFEEDING IS NOT POSSIBLE

Feeding tube, spoon, paladai or cup are the alternative methods of feeding when direct breastfeeding is not possible. Paladai is a shallow, steel bowl with a long beak.

DECIDING THE INITIAL METHOD OF PROVIDING FLUIDS AND FEEDING

The choice of method of providing fluids and feeds is not only dependent on maturity or birth weight but also whether the infant is sick or not.

Figure 7: Spoon-feeding



The suck-swallow-breathing coordination develops by 34 weeks of gestation. Most infants above 34 weeks (about 1,800 grams birth weight) should be able to feed directly from the breast.

Infants with a gestation of more than 30 weeks (birth weight more than 1200 grams) can usually swallow well and coordinate breathing, but are not able to suck. They can therefore be fed with spoon, paladai or cup that is not dependent on sucking action.

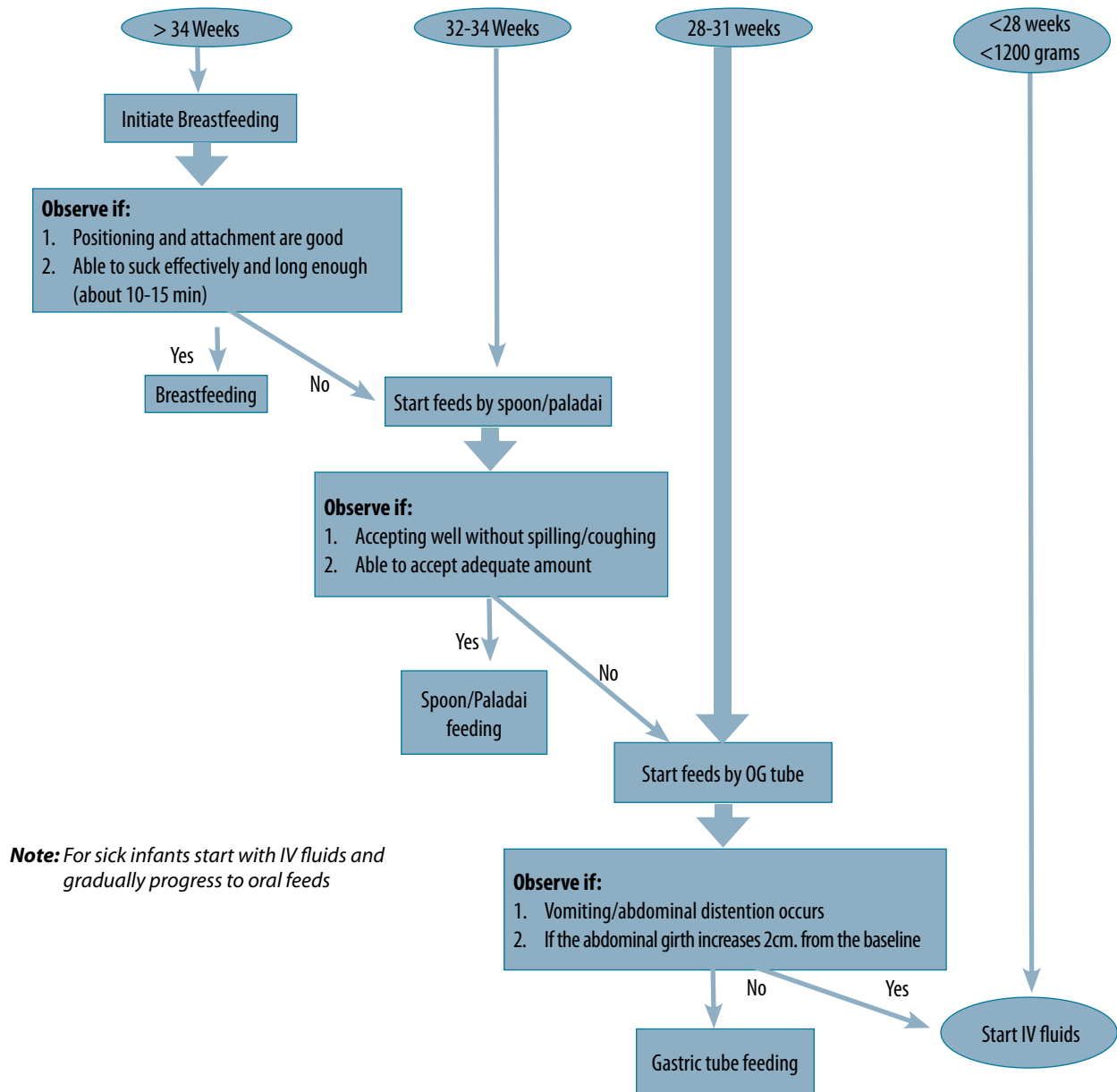
Infants below 30 weeks of gestation (birth weight less than 1200 grams) are not in a position to take feeds even with spoon, paladai or cup. They may be fed with intragastric tube.

Furthermore, sick, unstable infants (of any gestation or weight) who do not tolerate enteral feeds will require administration of intravenous fluids.

FEEDING PROGRESSION

As an infant's feeding ability develops, he or she should progress from the initial method through the intermediate steps to feeding exclusively from the breast directly.

Figure 8: Method of providing fluids and feeds for low birth weight infants



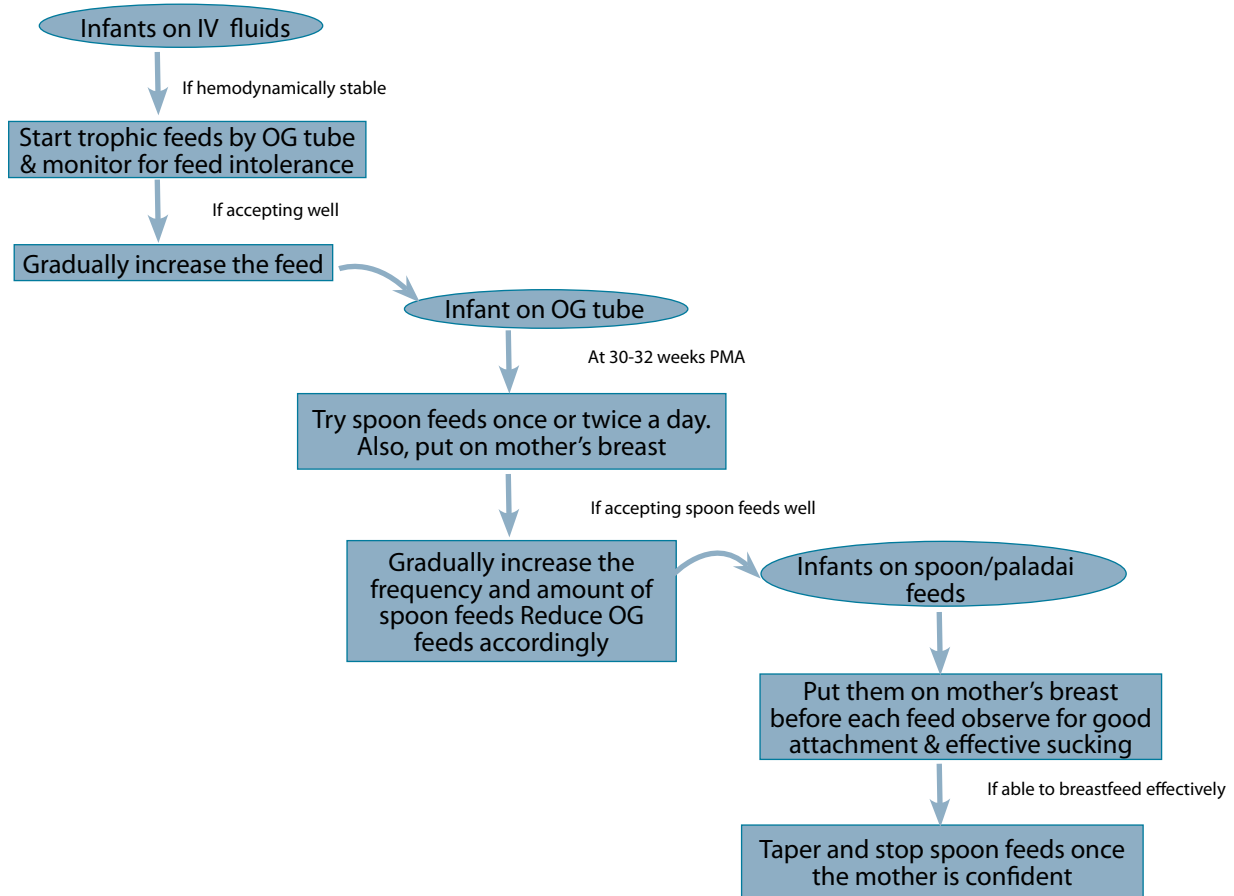
The ultimate aim is to ensure direct, exclusive breastfeeding.

LBW infants would have different methods of initial feeding based on their weight, gestation and feeding readiness. For progression of feeding, it is essential to periodically assess the infant's ability to accept

the next feeding method. *An infant breastfeeding effectively on the first day of life should continue to breastfeed exclusively up to 6 months.*

An infant given alternative oral feeds (tube, spoon, paladai, cup) should be given frequent opportunity to suckle at the breast before the next feed. When

Figure 5: Principles of advancing feeding modes



the infant can breastfeed effectively, other modes of feeding can be reduced gradually, over a few days, and discontinued.

An infant on IV fluids should be given small intragastric feeds. If the infant tolerates these, the volume can be increased and intravenous fluids reduced. When two thirds of the daily requirement is tolerated as enteral feed, IV fluids can be discontinued and enteral feeds increased over the subsequent days. When the infant shows readiness for oral feeding, small amounts can be offered by an alternative oral feeding method. The infant then progresses to breastfeeding as above.

HOW OFTEN AND HOW MUCH TO FEED?

LBW infants are usually fed **every 2 hours** at least 12 times in a day, the amount of each feed volume (to be given every 2 hour) is calculated on the basis of daily fluid requirements.

It is usual clinical practice to provide LBW infants of 1500 grams or more about **60 ml/kg** fluids on the first day of life. Infants less than 1,500g are usually given about **80 ml/kg** fluids on the first day of life. The feeds/fluids are increased by **15 ml/kg/day** to a maximum of 150 ml/kg/day by the end of the first week of life.

In stable LBW infants who are tolerating feeds well, the feed intake may be raised cautiously and gradually from 150 ml/kg to 180 ml/kg after the first week of life.

Table 1*: Fluid requirements for infants (ml/kg body weight/day) *These needs are met by enteral feeds and/or by intravenous fluid administration or a combination of the two*

Day of life	Fluid requirement ml/kg/day	
	Birth weight ≥ 1,500 g	Birth weight < 1,500 g
1	60	80
2	75	95
3	90	110
4	105	125
5	120	140
6	135	150
7	150	150

* For detail please read FBNC guideline.

SPECIAL CONSIDERATIONS FOR INFANTS BELOW 1200 GRAMS

Infants with birth weight less than 1,200g are usually born premature (before 30 weeks gestation) and often have various problems such as breathing difficulty, hypothermia, and hypoglycaemia. These infants need special care

with regard to maintenance of temperature, prevention of infections, etc. They require constant monitoring to help in early identification of clinical instability.

These infants are initially started on intravenous fluids as discussed already. The constant flow of intravenous fluids must be ensured to prevent excess administration or abrupt stoppage of fluids. Also, strict aseptic precautions should be observed while giving intravenous fluids.

They have to be gradually helped to initiate oral feeding so that ultimately they can receive direct, exclusive breastfeeding. Even while on intravenous fluids, they can be administered small amounts of intragastric tube feeds. This small amount of milk feeds is called **minimal enteral nutrition (MEN) or trophic feeds**. The purpose of trophic feeds is to help in the growth and maturation of the gastrointestinal tract. Infants started on MEN progress to full oral feeds faster.

The usual total amount of breast milk given as minimal enteral or trophic feeds is only 12 - 24 ml/kg/day divided into 4 - 6 feeds given via the intragastric route. As the infant stabilises, breast milk feeding is advanced to full requirements to meet her/his nutritional needs.

Criteria for discharge from the hospital and follow-up will be as mentioned on page 25.

Table 2: Micronutrient supplementation (as per WHO recommendations)

Micronutrient	Recommended Daily Dosage	Duration
Vitamin D	400-1000 IU/day (usually obtained from multivitamin drops and calcium and phosphorus supplement)	Six months (starting as soon as possible)
Iron	2 mg/kg/day	One year (starting at 2 weeks of age)
Calcium*	120 – 160 mg/kg/day	Till 40 weeks postmenstrual age
Phosphorus*	60 – 80 mg/kg/day	Till 40 weeks postmenstrual age

*Infants below 32 weeks of gestation

ADEQUATE WEIGHT GAIN

Most LBW infants lose weight in the first few days of life. Usually this loss would not exceed 10-15% of the birth weight. They regain their birth weight by about 2 weeks and then start gaining weight at the rate of 1.0% to 1.5% of body weight per day. Usually this corresponds to a gain of 15-20 grams per kilogram of their own body weight per day.

For small infants below 1,500 grams (less than 32 weeks), it is advisable to use a postnatal growth chart to plot weight every day until they are of 40

weeks PMA or 2500 grams. After that the MCP Card can be used to monitor growth.

If the infant has inadequate weight gain, the provider should check the amount of intake, and assess attachment (if taking direct breastfeeding), and spluttering / spillage (if on paladai / cup / spoon feeds). Nipple and breast problems in the mother should be looked for. Complications such as cold stress, sepsis, oral thrush, anaemia and late metabolic acidosis also lead to sub-optimal growth. The underlying reasons for inadequate weight gain should be addressed.

Ensuring adequacy of nutrition is perhaps the most important aspect of their care by monitoring frequency of urine (8-12 times for day) and weight gain (15-20 grams per day)



ACTION PLAN FOR IMPLEMENTATION AND SCALE-UP

- KMC Roll-out Plan
 - ◆ Structure
 - ◆ Capacity building strategy
 - ◆ Developing KMC Unit
 - Specifications for Building up a KMC Unit
- Role of programme managers
- Monitoring and evaluation
 - ◆ Definitions
 - ◆ Recording and reporting
 - ◆ Communication strategy
 - ◆ Evaluation



ACTION PLAN FOR IMPLEMENTATION AND SCALE-UP

This section provides information to the Programme Manager and health care providers on how to ensure that every LBW infant has access to high-quality KMC and optimal feeding within the existing Facility Based Newborn Care systems.

To fulfil this vision the roll-out has to be planned in phases by the states. Each state will have the flexibility to fix its own target for the next two years as per available resources. The state will have two options:

- a. Where new SNCUs/MCH wings are planned adequate provision for KMC will be an integral component of SNCU infrastructure and
- b. Where SNCU is already in place, KMC unit would be added in close proximity to the

SNCU or the postnatal ward. These units will have provisions for the postnatal mothers to provide KMC to their infants.

The aim is to advocate KMC to be practiced for all infants eligible for KMC at public health facilities.

KMC ROLL-OUT PLAN

Structure

The state will submit the budget proposal for establishing KMC as an additional expenditure under SNCU in the State's Annual Programme Implementation Plan of the National Health Mission. The state lead development partners will collaborate with the state governments for quality KMC roll out within the RMNCH+A strategy. Child Health Division, Ministry of Health and Family Welfare GOI will review the progress periodically. The Collaborative system established under Facility Based Newborn care will provide technical support.

VISION KMC

- Model KMC services to be established in 25 Regional & State Resource Centres by the end of 2017
- KMC services to be provided in all SNCUs and well-functioning NBSUs (at CHCs and FRUs) across the country

Child Health Division, Ministry of Health and Family Welfare GOI

National Collaborative Centre

WHO Resource Centre for Training and Research for Newborn Care at AIIMS, along with the designated National Collaborative Centre for Facility Based Newborn Care at KSCH & LHMC will be responsible for:

- ▲ Providing technical assistance for roll out of KMC & optimal feeding guideline
- ▲ Capacity building and Mentoring of Regional/State Collaborative Centers
- ▲ Developing training module and packages (if required)

Private sector participation

Government of India urges neonatologists, neonatal nurses and obstetrician-gynecologists by engaging with their respective professional bodies. These are:

1. National Neonatology Forum (NNF)
2. Indian Association of Neonatal Nurses (IANN)
3. Indian Academy of Paediatrics (IAP)
4. Federation of Obstetric and Gynaecological Societies of India (FOGSI)
5. Trained Nurses Association of India (TNAI)

These bodies can orient private facilities and nursing homes at the national, state and district levels so that all private facilities in the country align their KMC services and Optimal Feeding for Low Birth Weight infants along with the national guidelines.

Regional Collaborative Centres (RCC, Medical colleges/Teaching institute)

Existing FBNC resource centre and centers under KMC India network will serve as RCCs

- ▲ Each centre to have a model KMC unit for hands-on training
- ▲ RCCs to provide training and mentoring to SCCs and district level health providers
- ▲ RCCs will be responsible for monitoring and supervision of SCCs

State Collaborative Centres (SCC, Medical colleges)

- ▲ Each centre to have a model KMC unit equipped with mannequins (skill stations) for hands-on training SCCs
- ▲ To provide monitoring, supervision and mentoring to district level facilities

National level

- ▲ Orientation and Dissemination of the guidelines for programme managers and professional associations
- ▲ Regular review by Child Health Division, MoHFW
- ▲ Provide cross-learning facility for programme managers and health providers at model units.

State Level

- ▲ Orientation cum planning workshops at State level
- ▲ Identification of medical colleges as state resource centres
- ▲ Initially, saturate the SNCUs with KMC services on priority
- ▲ Develop resource pool for training
- ▲ Ensure adequate and trained human resource at SNCU
- ▲ Seek support from respective state lead development partners to ensure high quality implementation
- ▲ Provide mentoring and supportive supervision or hands-on training to the providers
- ▲ Review progress of implementation every quarter
- ▲ Developing linkages with RBSK and community follow-up by ASHA
- ▲ Integrate KMC into FBNC

District Level

- ▲ Carry out civil work/refabricating necessary for ensuring KMC
- ▲ Conduct orientation/refresher trainings of counsellors
- ▲ Identify high case load facilities for ensuring KMC services
- ▲ Ensure record keeping and timely reporting at facilities

Capacity building strategy:

Job-aids, videos and training agenda for KMC and optimal feeding of LBW infants are being provided along with the guidelines for state support. The existing training modules for F-IMNCI and FBNC may be used for orientation. The checklist for KMC also being used in skill lab is placed as Annexure V.

Developing a KMC Unit

1. KMC Unit of 8-10 beds is recommended for every hospital with SNCU or should be located as close to the SNCU as possible in the existing / new premises. Infants weighing less than 1800 g, who will form the majority of the KMC beneficiaries, would be admitted to Special Newborn Care Units (SNCUs) at district hospitals if their condition warrants admission

2. KMC unit should be built as an integral part of the new/upcoming SNCUs (20-bed) and in MCH wings
3. KMC services can also be provided in NBSU or Postnatal wards. All the stable infants weighing more than 2000 grams can be easily nursed in the postnatal ward or at NBSUs
4. The neonatal units at all Medical Colleges to be strengthened to provide appropriate newborn care including KMC. This will enable the undergraduate and postgraduate medical students to learn the best practices.

Specifications for Building up a KMC Unit

As a routine, feeding and other care to unstable or sick preterm / LBW infants is provided in Special

Newborn Care Units (SNCUs). Thereafter, when the infants become stable, KMC is initiated under supervision of the nurses/doctors in SNCU. With further improvement, infants must be transferred out from the SNCU to the mother in the postnatal ward where KMC is continued till discharge. Accordingly, it is recommended that each hospital with an SNCU should provide KMC and have a KMC unit (KMC Unit)

KMC units must ensure the room temperature is 24 to 26 degree Celsius with 50-60% relative humidity.

The room should also be well lit, well ventilated and have arrangement for dim light at night.

Following is the budget for establishing a model KMC unit, **however, provision of KMC should not wait for the establishment of KMCU.**

This may also be used as a guide for budgeting the proposal for setting up KMC in the state PIP. State should do need based gap analysis to budget judiciously for setting up KMC units.

S. No.	Heads	Essential	Desirable	Unit cost (INR)	Units needed	Total cost (INR)
A. Infrastructure: Total 1500 square feet; i.e. 140 Sq M: 120 square feet for each bed (120x8 = 960 square feet) and rest will use as ancillary area, toilet, bathing & hand washing area						
1	Renovation or Minor civil work	✓		100000	1	100,000
B. Furniture						
2	Beds semi-reclining	✓		12000	8	96000
3	Easy chairs (reclining with foot support)	✓		5000	8	40000
4	Storage space/locker for mothers	✓		2000	8	16000
5	Office chairs	✓		500	8	4000
C. Furnishing						
6	Mattress	✓		3000	8	16000
7	Pillows	✓		300	16	4800
8	Bed sheets	✓		200	16	3200
9	Adult blanket	✓		800	16	12800
10	Baby blanket	✓		500	16	8000
11	Mobile screen		✓	From regular budget		
12	Dust bins	✓		From regular supply		
13	Refrigerator (165L - 230L)		✓	15,000	1	15000
14	AV aids (Television & CD player)		✓	25,000	1	25,000
D. Equipment						
15	Bag & Mask (Size 0 & 1)	✓		1500	1	1500
16	Digital Weighing machine	✓		3,000	1	3,000
17	Paediatric stethoscope	✓			2	
18	Digital & Room thermometers	✓		200X2	2	800
19	Heater (Radiant/air blower)		✓	From regular budget		
20	Oxygen cylinder & Oxygen hoods		✓	From regular supply		

S. No.	Heads	Essential	Desirable	Unit cost (INR)	Units needed	Total cost (INR)
21	Training manikins etc	✓		10000	1	10000
E. Recurring cost per annum						
21	Feeding equipment (Tubes, Katoris& Spoons)	✓		100	200*	20000
22	Clothes for newborns (Disposable Diapers, Cap & Socks)	✓		110 (Disposable Diapers) 40 (Cap & Socks)	200*	30000
23	Gowns for Mothers		✓	100	200*	20000
24	Soap & other cleaning agents	✓		1000	12	12000
25	Emergency medicines, cotton, gauge	✓		From regular supply		
26	Record registers/case sheets			From regular supply		
27	Other maintenance cost	✓		1500	12	18000
F. Human resources**						
28	ANM/GNM/YASHODA/Counsellor		✓	12000X12	4	576000
Grand Total (Including cost of desirable heads)						1032110
Total (Cost of essential heads)						266100

For storing breast milk

*Available regularly with most SNCUs. Therefore, utilize from regular supply and may budget, if required.

**States to ensure saturation with adequate and trained HR as per norms including salary . The figures quoted here are normative.

Budgetary provision: To roll out the KMC and optimal feeding practices at scale, the state will have to make adequate budgetary provisions for state level training workshops and establishment cost of KMC Unit in state PIPs.

ROLE OF PROGRAMME MANAGERS

The state programme manager/Child Health nodal officer will play the most crucial role. S/He must:

1. Know that KMC is an integral part of facility based newborn care
2. Ensure orientation of all the district nodal officers on KMC
3. Issue a Facility wise timeline where KMC needs to be started to all the districts

4. Track the progress of implementation of KMC according to the guidelines as per the final timeline
5. Link with the National/Regional/State collaborative centre and Existing Supportive Supervision mechanisms in the state and utilize and modify existing checklists and block monitoring formats to include practice of KMC

All contacts with the technical personnel/service providers should be utilised for promoting KMC during mentoring visits. The checklist for training in KMC is being attached for reference and is similar to the one used in skills lab trainings (annexure-). FBNC trainings need to be expedited by the states with special focus on KMC and optimal feeding in LBW.

6. Linking the follow-up with SNCU follow-up and DEIC if required extra care
7. Willing Professionals from private sector/ Professional bodies may be involved in training programmes as trainees as well as trainers for maximizing effect in private sector mentoring and supervision activities
4. Percent (%) of pre-term newborns who received KMC till 40 weeks (Expected Delivery Date or full term) = $\frac{\text{Number of pre-term newborns who received KMC till 40 weeks}}{\text{Total number of newborns delivered preterm}} \times 100$

Recording and reporting

The data for above monitoring indicators can be compiled at the district level every month and can be sent to the state along with the SNCU reports. For states which have migrated to online reporting mechanism, may utilize the same platform for reporting. After compiling and validating the reports at the state level, these can be shared at the national level on a quarterly basis. During supportive supervision visits the data may be validated from the case sheets and registers.

MONITORING AND EVALUATION:

Existing monitoring frameworks for FBNC are to be modified to capture the indicators given below; these indicators will provide information on how the programme is functioning.

Definitions

Output indicators:

1. Percent (%) of health facilities having SNCUs with operational KMC unit = $\frac{\text{Number of health facilities having SNCU with operational KMC unit}}{\text{Total number of health facilities with functional SNCU}} \times 100$

Outcome indicators

1. Percent (%) of newborns with birth weight below 2,000 grams delivered in the health facility = $\frac{\text{Number of low birth weight infants (below 2,000 grams) delivered in the facility}}{\text{Total number of live births in the facility}} \times 100$
2. Percent (%) of newborns below 2,000 grams who continued KMC till discharge = $\frac{\text{number of newborns with birth weight below 2,000 grams who continued KMC till discharge}}{\text{total newborns with birth weight below 2,000 grams}} \times 100$
3. Percent (%) of pre-term infants (gestation age less than 37 weeks) delivered in the health facility = $\frac{\text{Number of pre-term infants (gestation age less than 37 weeks) delivered in the facility}}{\text{Total number of live births in the facility}} \times 100$

Communication strategy

Any state specific barriers in implementation should also be identified. The messages should enhance the woman's ability to use existing services and to make appropriate decisions. The communication materials should be consistent with the training materials, so that there is an integrated training-communication package. Both, the mass media and interpersonal communication are needed. Equally crucial will be all those in the community who have a determining influence on the mothers' behaviour: their husbands and families, elders, religious leaders and others. Communication messages should also be directed at key decision-makers. Communication must be supplemented by an education programme and synchronised with the health services

Way Forward

As the two high impact interventions viz. KMC and feeding of Low Birth Weight infants are being up-scaled an implementation research will be useful for sharing the key learning and making midcourse corrections, if required.



ANNEXURES

- Annexure I: Manual Expression of Breast milk and Storage Thereof
- ANNEXURE II: Alternative Feeding Methods (Cup/Spoon/Paladai Feeding)
- Annexure III: Follow-up protocol after discharge of a high-risk infant
- Annexure IV: Infant Milk Substitutes act
- Annexure V: Orientation on Kangaroo Mother Care

MANUAL EXPRESSION OF BREAST MILK AND STORAGE THEREOF

For whom:

Infants who cannot breastfeed effectively but are able to accept oral feeds by alternative feeding methods and for the purpose of storing breast milk.

- ◆ At least 6-8 times in 24 hours, i.e. every 3-4 hours, including at night to help ensure an adequate supply.

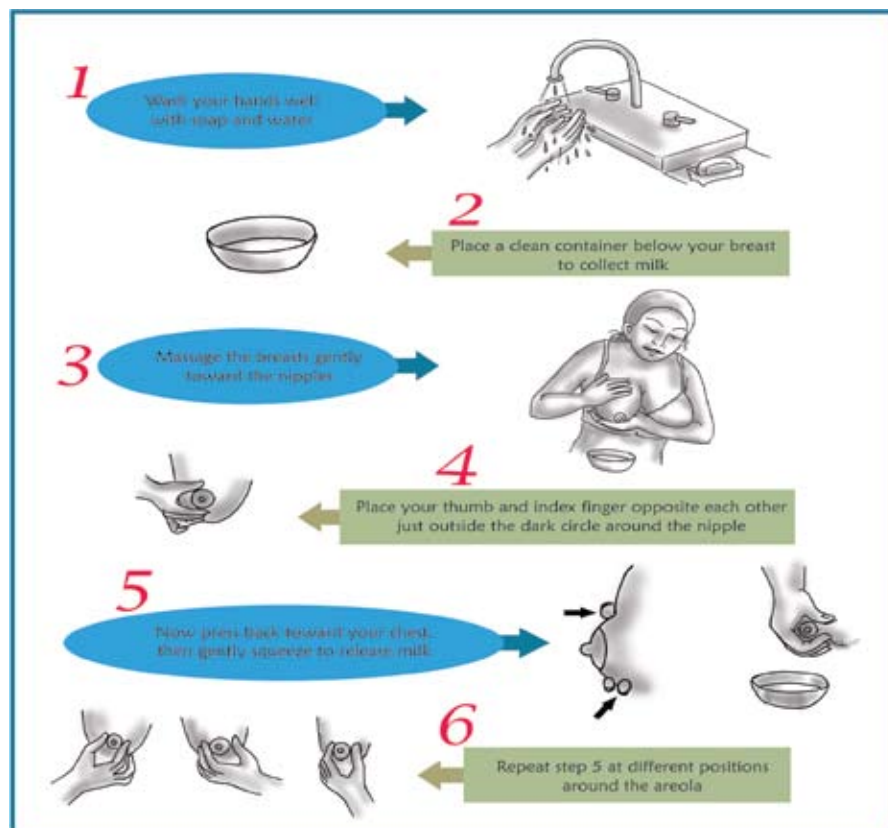
How often

- ◆ Within 6 hours of delivery to ensure that colostrum is available

Procedure

The salient steps of manual expression of breast milk are shown in the figure below.

Figure (i): Expression of breast milk



If expressed breast milk (EBM) cannot be given to the infant soon after expression, it has to be stored and used when necessary. The expressed milk can be stored in one of the following ways:

At room temperature: EBM can be kept at room temperature for up to 6 hours without significant risk

of bacterial growth. It should be kept in a covered container. Any milk not fed to the infant within 6 hours of expression should be discarded.

In a refrigerator: EBM can be stored in the main compartment of a regular refrigerator (2°C to 8°C) for 24 hours.

Storage of expressed breast milk

At room temperature : 6 hours

In refrigerator (2°C to 8°C) : 24 hours

ALTERNATIVE FEEDING METHODS (CUP/SPOON/PALADAI FEEDING)

1. SPOON-FEEDING

A spoon is appropriate for an infant who is stable and is able to co-ordinate breathing and swallowing.

HOW TO SPOON-FEED AN INFANT

1. The infant should be awake and held sitting semi-upright on the caregiver's lap.
2. Put a measured amount of milk in a wide necked container.
3. Take some milk from the container into the spoon.
4. Hold the spoon so that it rests lightly on the infant's lower lip.
5. Tip the spoon so that the milk reaches the infant's lips.
6. If possible allow the infant to take the milk by him or herself and do not pour it into the infant's mouth.
7. Feed the infant slowly, making sure that the milk already given has been swallowed before giving any more.
8. When the infant has had enough, he or she will close his or her mouth and will not take any more. Do not force-feed an infant.
9. Estimate the amount of milk taken in the same way as for cup feeding.

2. "PALADAI" FEEDING

A paladai is a small steel bowl with a long pointed tip traditionally used for feeding LBW infants in some

Figure (ii): Feeding a LBW infant with a paladai



cultures. It is appropriate for an infant who is stable and is able to coordinate sucking, breathing and swallowing. The advantages of this feeding method are that it is usually faster than spoon or even cup feeding and also that there is less spillage.

It has become very popular in neonatal nurseries in all parts of the country.

The steps of 'paladai' feeding are given in the box below:

HOW TO FEED AN INFANT WITH A 'PALADAI'

1. The infant should be awake and held sitting semi-upright on the caregiver's lap, and wrapped to provide support and to keep the arms out of the way, as for cup feeding.
2. Put a measured amount of milk in the paladai.
3. Hold the paladai so that the pointed tip rests lightly on the infant's lower lip.

4. Tilt the paladai to pour a small amount of milk into the infant's mouth gently.
5. Feed the infant slowly.
6. Make sure that the infant has swallowed the milk already taken before giving any more.
7. When the infant has had enough, she will close his or her mouth and will not take any more. Do not force-feed the infant.
8. Estimate the amount of milk taken.
9. Wash the paladai with soap in running water and air-dry it before and after each use.

3. CUP FEEDING

It is appropriate for an infant who is stable and is able to coordinate sucking, breathing and swallowing. The advantages of this feeding method are that it enables an infant to control his own intake in time and quantity.

The cups used and the method of cup feeding is depicted in the figures below:

Figure iii: Feeding a LBW infant by cup



HOW TO CUP FEED AN INFANT

1. The infant should be awake and held sitting semi-upright on the caregiver's lap. Wrap the infant in a cloth to provide support and to keep his or her arms out of the way, and put a small cloth on his or her front to catch drips of milk.
2. Put a measured amount of milk in the cup.
3. Hold the cup so that it rests lightly on the infant's lower lip.
4. Tilt the cup so that the milk reaches the infant's lips.
5. Allow the infant to take the milk himself. (A younger infant will initially lap the milk into his mouth with his tongue. A full term or older infant will suck the milk.)
6. Do not pour the milk into the infant's mouth. Hold the cup to the infant's lips so that and he or she can take it himself or herself.
7. Feed the infant slowly. Some milk may spill from the infant's mouth. Spilling is commoner with more mature infants.
8. Make sure that the infant has swallowed the milk before offering more. When the infant has had enough, he or she will close his or her mouth and will not take any more. Do not force-feed the infant.
9. To estimate the amount of milk taken, subtract the milk left in the cup from the original amount. Also subtract the estimated spillage, if any.
10. Wash each utensil with soap in running water and air-dry it before and after each use.

4. INTRA-GASTRIC TUBE FEEDING

Intra-gastric feeding is provided to the stable infants who are not able to accept oral feeds (not able to coordinate breathing with swallowing). Intra-gastric tube feeding can be given by two routes, namely, naso-gastric or oro-gastric. Naso-gastric tube has the advantage that it is more easily fixed in place. But by blocking one nostril it may lead to apnoea or breathing difficulty. Oro-gastric tubes is preferred for smaller infants.

PROCEDURE

Selecting the correct tube size

The correct tube size for intra-gastric feeding of small infants is shown in below:

Recommended intra-gastric tube sizes	
Weight	Tube size
< 2000g	French 6
≥2000g	French 8

Inserting an intra-gastric tube

INSERTING AN INTRA-GASTRIC TUBE

1. Estimate the length of gastric tube required
 - Hold the tip of the feeding tube at the tip of the infant's nose, then hold the length of the tube up to the ear lobe and then on to the infant's abdomen to a point between the xiphisternum and umbilicus.
 - Mark the measured length of the tube with a pen or piece of tape.
2. Inserting the gastric tube
 - Flex the infant's neck slightly and pass the tube gently through the mouth or one nostril to the required distance.
3. Checking the position of gastric tube
 - Take 1-2 ml of air into the syringe. Listen over the infant's stomach with a stethoscope while quickly injecting the air down the tube. If the end of the tube is in the stomach, you will hear a whistling sound as the air passes through.

OR

 - Attach a syringe to the open end of the tube and aspirate the contents of the stomach. The aspirate should look like curdled milk
4. Secure the tube on the infant's cheek with adhesive tape.

The steps of insertion and fixation of oro-gastric tube are illustrated in figure A and figure B respectively The

Figure A: Inserting an oro-gastric tube



Figure B: Fixing oro-gastric tube



oro-gastric tube has to be replaced every 3 days or earlier if it is pulled or blocked.

The procedure of giving a gastric tube feed is explained in the box below:

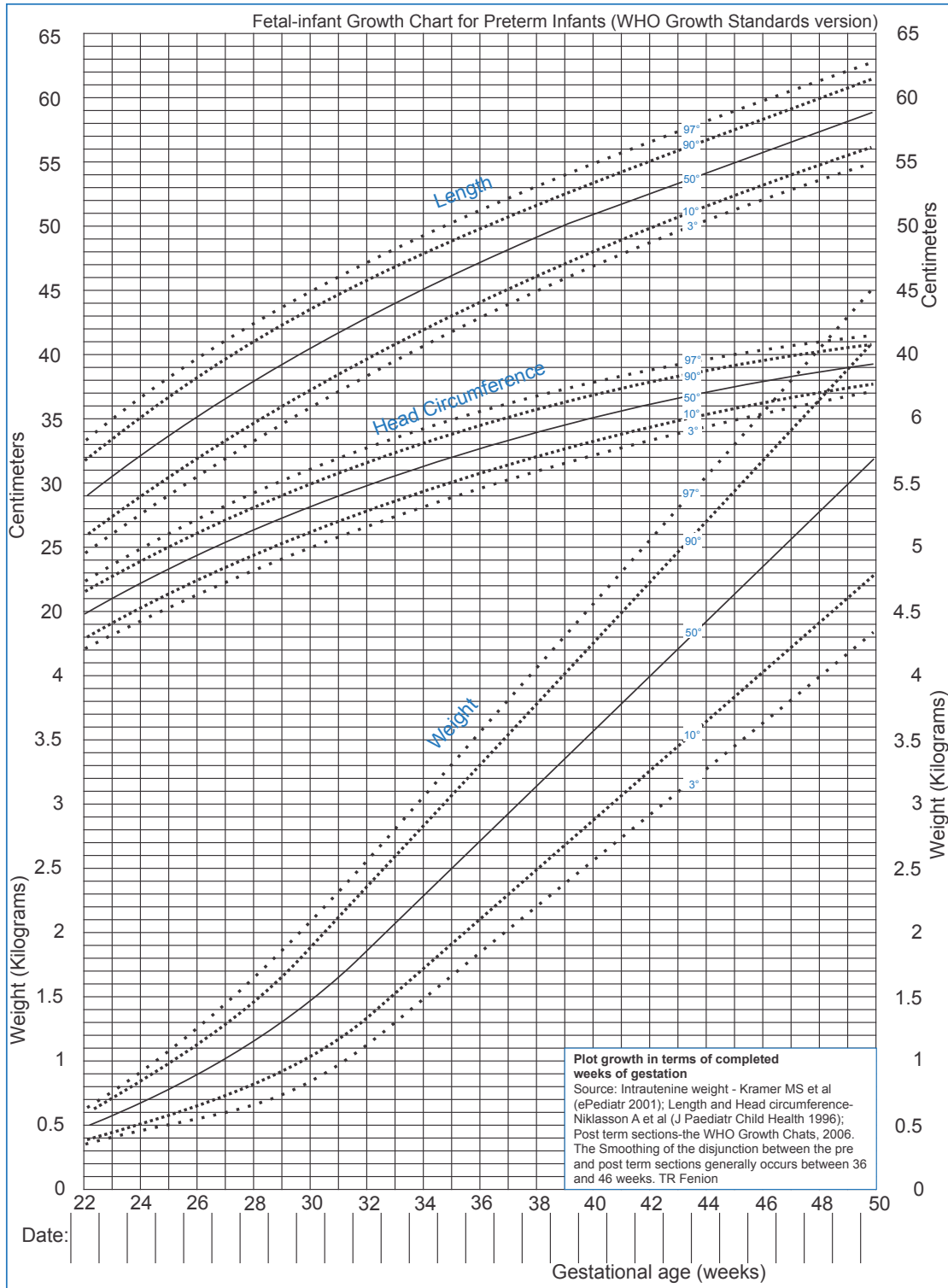
PROCEDURE FOR GIVING A GASTRIC TUBE FEED

1. Remove the plunger of a 10 or 20 ml sterile syringe.
2. Connect the barrel of the syringe to the end of the gastric tube.
3. Fill the barrel of the syringe with the required volume of milk.
4. Let the milk run from the syringe through the gastric tube under gravity.
5. DO NOT force milk through the gastric tube by using the plunger of the syringe.
6. Hold the syringe 5-10 cm above the infant until the syringe is empty.
7. It should take a few minutes for the milk to flow into the infant's stomach. Changing the height of the syringe will also affect the speed of milk flow. Lowering the syringe slows the milk flow, raising the syringe makes the milk flow faster.
8. Observe the infant during the entire gastric tube feed. Do not leave the infant unattended. Stop the tube feed if the infant shows any of the following signs: breathing difficulty, color change (looks blue), becomes floppy or vomits.
9. Cap the end of the gastric tube after the milk has been instilled. **There is no need to rinse the tube with water.** Keep tube capped between feeds.

FOLLOW-UP PROTOCOL AFTER DISCHARGE OF A HIGH-RISK INFANT

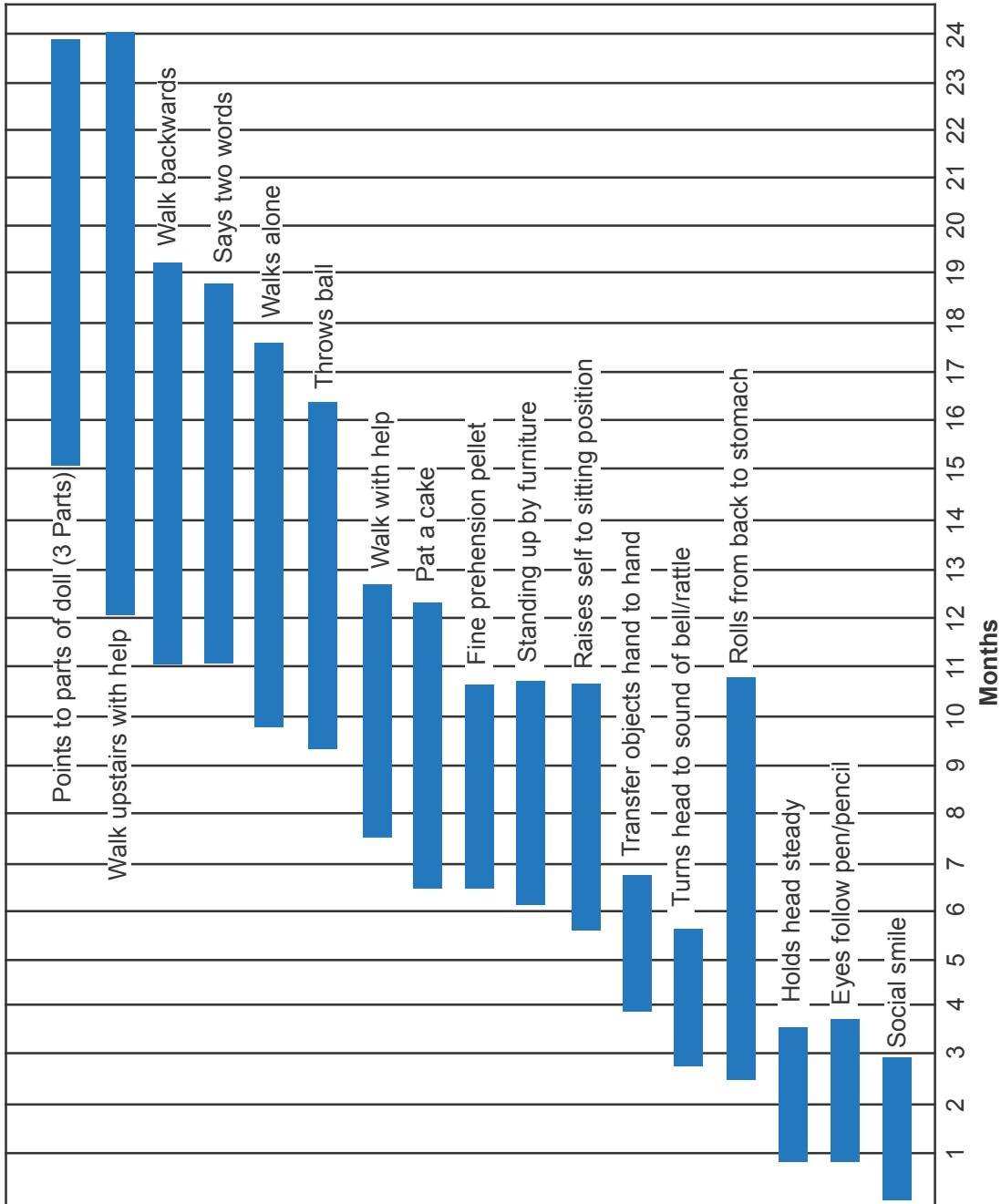
S. No	Area	Frequency	Details	Remarks
A	Anthropometry	Every visit	Weight HC L	Always estimate if the gain is adequate
B	Breastfeeding	Every visit	Attachment Positioning Problems	Observe a breastfeeding session if possible
C	Counselling	Every visit	Feeding Hygiene KMC Innocuous issues	Ask mother about her concerns
D	Development screening	3, 6, 9, 12 months	Use TD screening chart	Fill up the chart and refer where needed for detailed developmental evaluation
E	Eye	1 month for infants <1750 grams to <2000 grams with stormy NICU course. Detailed examination at 9-12 months of age	Emphasize on getting a retinopathy (ROP) screening from a skilled ophthalmologist	Review in next visit
F	Follow-up USG	At discharge and at 40 weeks PMA	To rule out PVL and other abnormalities	
G	Growth Monitoring	Every Visit	Plot the growth of the infant on the WHO growth charts	Use of the Fenton chart till the infant is 40 wks PMA and WHO charts thereafter
H	Hearing	At 40 wks PMA and in case questionable, at 6 weeks of age	One can use the OAE/BERA or combination as per the policy	
I	Immunization	As per schedule		
J	Others	Language/speech at 1,2,3 years Behavior at/after 1 year IQ testing at 3 years of age		Any delay detected should prompt early intervention

Fenton Chart



In 2013 WHO revised it and separate charts for boys and girls are available. To avoid confusion with the message in FBNC training module only single chart is being referred .

TD Screening Chart



A vertical line is down, or a pencil is kept vertically, at the level of the age of the child (in months) being tested. If the child achieve any item that falls short on the left side of the vertical line, the child is considered to have a developmental delay.

INFANT MILK SUBSTITUTES ACT

The Infant Milk Substitutes, Feeding Bottles and Infant Foods (regulation of production, Supply and Distribution) Act, 1992 and as amended act in 2003

This Act provides for the regulation of production, supply and distribution of infant milk substitutes, feeding bottles and infant foods with a view to the protection and promotion of breastfeeding and ensuring the proper use of infant foods and for matters connected to it. It extends to the whole of India. It also lays the responsibility of health workers and of the government to provide accurate information to people. Following are the basic provisions of the IMS Act.

THE IMS ACT PROVISIONS

IMS act is violated if any baby Food Company, its distributor or supplier, or any person

1. Promotes any food by whatever name, for children up to two years.
2. Promotes use of infant foods before the age of six months.
3. Advertises by any means--television, newspapers, magazines, journals, through SMS, emails, radio, pamphlets etc.
4. Distributes the product or samples to any person.
5. Contacts pregnant or lactating mothers using any person.
6. Gives any kind of inducements like free gifts, tied sales, to anyone.
7. Distributes information and educational material to mothers, families etc. (They

can give educational material to health professionals like doctors, nurses etc provided it has information prescribed in clause 7 of the IMS Amendment Act, 2003. The education material should have only factual information and should not promote the products of the company).

8. Gives tins, cartons, accompanied leaflets of these products having pictures of mothers or infants, cartoons or any other such images to increase saleability.
9. Displays placards, posters in a hospital, nursing home, chemist shop etc. for promoting these products.
10. Provides direct or indirect inducements to health workers
11. Demonstrates to mothers or their family members how to feed these products. However, a doctor can demonstrate this to the mother.
12. Gives benefits to doctors, nurses or associations like IAP, IMA, NNF etc, for example, funds for organizing seminars, meeting, conferences, contest, fee of educational course, sponsoring for projects, research work or tours.
13. Fixes commission of employees on the basis of volume of sales of these products.

HIGHLIGHTS OF THE ACT

1. Prohibits all persons from any kind of promotion of infant milk substitutes, infant foods or feeding bottles

2. Prohibits the advertisement of infant milk substitutes and feeding bottles to ensure that no impression is given that feeding of these products is equivalent to, or better than, breastfeeding.
3. Prohibits providing free samples and gifts to pregnant women, mothers of infants and members of the families.
4. Prohibits donation of free or subsidized supplies of products for health care institutions and prohibits incentives and gifts to health workers.
5. Prohibits display of posters at health care facilities / hospitals /health centres.
6. The Act also prescribes that all labels of IMS /Infant food, must say in English and local, languages that breastfeeding is the best. Also, the labels must not have pictures of infants or women or phrases designed to increase the sale of the product.
7. Prohibits any contact of employers manufacturing and distributing company with pregnant women, even for providing educational material to them.

ORIENTATION ON KANGAROO MOTHER CARE

Objective

By the end of this exercise the participant should be able to demonstrate Kangaroo Mother Care

Steps for providing Kangaroo Mother Care

1	Counsel the mother, provides privacy to the mother. Request the mother to sit or recline comfortably
2	Undress the baby gently, except for cap, nappy and socks
3	Place the baby prone on mother's chest in an upright position with the head slightly extended, between her breasts in skin to skin contact in a frog like position; turn baby's head to one side to keep airway clear. Support the baby's bottom with a sling/binder.
4	Cover the baby with mother's 'pallu' or gown; wrap the baby-mother duo with an added blanket or shawl depending upon the room temperature
5	Advise mother to breastfeed the baby frequently
6	Ensure warm room with room temperature maintained between 25 – 28° C.
7	Advise the mother to provide KMC for at least 1 hour per session. The length of skin-to-skin contact should be as long as possible

Key Points

Eligibility criteria for KMC

- ◆ All LBW infants.
- ◆ Sick hemodynamically stable infants needing special care (even those on IV Fluid or on Oxygen)

The two components of KMC are:

- ◆ Skin-to-skin contact
- ◆ Exclusive breastfeeding

The two prerequisites of KMC are:

- ◆ Support to the mother in hospital and at home
- ◆ Post-discharge follow-up

Benefits of KMC

- ◆ Reduces risk of hypothermia
- ◆ Promotes lactation and weight gain
- ◆ Reducing infections and hospital stay
- ◆ Better bonding between Mother and newborn

POINTS TO REMEMBER

1. Ensure room is warm (25 -28° C)
2. Health professionals should be skilled for providing immediate emergency care, in case required

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KANGAROO MOTHER CARE

PREPARATION FOR KMC



COUNSELLING & DEMONSTRATION FOR KMC



KMC POSITION



WHO CAN PROVIDE KMC (FATHER AND OTHER RELATIVES)



FEEDING METHODS FOR LBW INFANTS

CUP, SPOON AND PALADAI



TUBE FEEDING





Child Health Division
Ministry of Health and Family Welfare
Government of India