

# CLINICAL PRACTICE GUIDELINE KANGAROO MOTHER CARE

## Executive summary

Working Group on Developmental and Family-Centered  
Care from the Spanish Society of Neonatal Nursing  
(SEEN)



Consejo General de Colegios Oficiales  
de Enfermería de España

**seNeo**



Sociedad Española  
de Neonatología

## 1. QUESTIONS AND SUMMARY OF RECOMMENDATIONS

### SECTION 1: IMPACT OF KANGAROO MOTHER CARE (KMC)

1. **What is the impact of KMC on morbidity and mortality in preterm newborns (PTNB)?**  
Quality of evidence: HIGH
2. **Is KMC effective in reducing healthcare-associated infections in PTNB?**  
Quality of evidence: HIGH  
Summary: KMC is effective in reducing healthcare-associated infections and sepsis in PTNB.
3. **Does KMC reduce hospital stay and the likelihood of readmission in PTNB?**  
Quality of evidence: MODERATE  
Summary: KMC appears to be effective in reducing hospital stay and readmission rates in PTNB.
4. **Does KMC improve apnoea, heart rate, temperature, respiratory rate, and oxygen saturation?**  
Quality of evidence: HIGH  
Summary: KMC stabilises heart rate, respiratory rate, oxygen saturation, and temperature, thus contributing to stabilising and improving cardiorespiratory function in PTNB.
5. **Is KMC beneficial for the neurodevelopment of PTNB?**  
Quality of evidence: HIGH  
Summary: KMC promotes neurocognitive development in PTNB compared to conventional incubator care.
6. **Does KMC improve cerebral oxygenation in PTNB?**  
Quality of evidence: MODERATE  
Summary: Stable PTNB, regardless of respiratory support, maintain stable cerebral oxygen saturation (ScvO<sub>2</sub>) during KMC with a slight upward trend.
7. **What is the impact of KMC in preventing intraventricular haemorrhage in PTNB?**  
Quality of evidence: LOW  
Summary: KMC may benefit cerebral oximetry and aid in the prevention of intraventricular haemorrhage in PTNB.
8. **What is the impact of KMC on PTNB sleep?**  
Quality of evidence: MODERATE  
Summary: KMC is more effective during sleep periods, as it improves sleep cycles and reduces the number of awakenings, thereby improving oxygenation in PTNB.
9. **What effect does KMC have in reducing pain during painful procedures compared to other non-pharmacological measures in PTNB?**  
Quality of evidence: HIGH  
Summary: KMC, compared to incubator care or other non-pharmacological measures, reduces pain during invasive and/or painful procedures in PTNB.

10. **How does parental involvement affect pain control in PTNB?**  
Quality of evidence: MODERATE  
Summary: Parental involvement as active caregivers during painful procedures reduces the manifestations of intensity of pain in PTNB.
11. **Is KMC alone or in combination with sucrose more effective in reducing procedural pain in PTNB?**  
Quality of evidence: HIGH  
Summary: KMC together with administering sucrose did not provide greater benefits in reducing pain during a heel prick in PTNB than KMC alone.
12. **Is KMC beneficial for initiating and maintaining breastfeeding in preterm infants?**  
Quality of evidence: HIGH  
Summary: KMC benefits breastfeeding initiation and maintenance in PTNB.
13. **What is the impact of KMC on feeding methods and growth on PTNB or very low birth weight infants (VLBWI)?**  
Quality of evidence: HIGH  
Summary: KMC carried out at least six hours per day is related to higher rates of exclusive breastfeeding and increase weight gain, length, and head circumference. Early KMC (before the first week of life) is linked to reduced need for parenteral nutrition, shorter duration of nutritional support, and improved feeding tolerance.
14. **Does KMC promote bonding and attachment between PTNB and their families?**  
Quality of evidence: MODERATE  
Summary: KMC promotes family bonding and attachment between PTNB and their families.
15. **What effect does KMC have on maternal and paternal health?**  
Quality of evidence: HIGH  
Summary: KMC reduces maternal anxiety, depression, and stress, and improves maternal attachment and sleep quality.

## SECTION 2. CANDIDATES PROVIDING KANGAROO MOTHER CARE

16. **Can a preterm newborn with respiratory support undergo KMC?**  
Quality of evidence: MODERATE  
Strength of recommendation: WEAK. Providing KMC is suggested for neonates with invasive or non-invasive respiratory support.
17. **Is it safe to do KMC on intubated preterm newborns?**  
Quality of evidence: MODERATE  
Strength of recommendation: STRONG. Carrying out KMC on neonates with orotracheal or nasotracheal intubation does not increase rates of accidental extubation. However, regarding ventilation-associated pneumonia, recommendations cannot be made due to lack of evidence.

**18. Is it safe to do KMC on a preterm newborn with a central venous catheter?**

Quality of evidence: MODERATE

Strength of recommendation: STRONG. Doing KMC does not increase rates of accidental dislodgement of central or peripheral catheters, nor does it increase catheter-related bacteraemia.

**SECTION 3. TRAINING FAMILY FOR KMC**

**19. Does early family education increase their involvement in providing KMC?**

Quality of evidence: LOW

Strength of recommendation: WEAK. Prenatal or early information for families may increase their involvement in doing KMC.

**20. Is parental training effective in increasing their capacity to do KMC?**

Quality of evidence: MODERATE

Strength of recommendation: STRONG. It is recommended to provide standardized KMC information to parents and to conduct training sessions enhancing their skills and capacity in providing KMC.

**SECTION 4: PROVIDING KANGAROO CARE**

**21. When and for how long should KMC be carried out on preterm newborns?**

Quality of evidence: MODERATE

Strength of recommendation 1: WEAK. Immediate KMC should be initiated (within the first hour of life) or as soon as possible.

Strength of recommendation 2: STRONG. Provide KMC for at least 6-8 hours per day.

**22. Who should do KMC? Mother, father, or others?**

Quality of evidence: MODERATE

Strength of recommendation 1: STRONG. Whenever possible, the mother should be the primary provider of kangaroo care, meanwhile the father/partner should also be encouraged to provide KMC.

Strength of recommendation 2: WEAK. Another family members may do KMC if the parents are unavailable or as a rest period for the parents.

**23. Does using support devices, such as wraps or ergonomic carriers, improve KMC implementation?**

Quality of evidence: MODERATE and EXPERT CONSENSUS

Strength of recommendation 1: WEAK. Using ergonomic supports may increase the duration of KMC and improve both the parents and preterm newborn's comfort and satisfaction.

Strength of recommendation 2: STRONG. It is recommended to place the wrap low on the provider's abdomen, lifting it after a few minutes of holding the baby.

Strength of recommendation 3: STRONG. It is recommended to use cotton or synthetic Lycra wraps as an alternative.

**24. Does the use of a baby's bonnet during KMC help maintain normal temperature in preterm newborns compared to not using one?**

Quality of evidence: LOW and EXPERT CONSENSUS

Strength of recommendation: WEAK. The use of a baby's bonnet for KMC is recommended, although it depends on the baby's gestational age and initial temperature. A blanket or head covering can be used as an alternative.

**25. Is it necessary to protect the preterm newborn from light and sound during KMC?**

Quality of evidence: MODERATE

Strength of recommendation: STRONG. It is recommended to create an optimal environment during KMC by reducing light (<600 lux) without covering the newborn's eyes, and by keeping noise levels suitable (<65 dB).

**26. Does the posture and comfort of parents affect the duration of KMC?**

Quality of evidence: LOW and EXPERT CONSENSUS

Strength of recommendation: STRONG. A comfortable reclining armchair with a 15-30° angle is recommended to improve the kangaroo provider's posture and potentially increase KMC duration.

**27. How many people are recommended for the transfer from the incubator to the family member providing KMC?**

Quality of evidence: LOW

Strength of recommendation: WEAK. When doing a transfer it is recommended to be done by two people (at least one being a healthcare professional) and depending on the baby's overall condition, days since birth, equipment involved, intubation status, and the parents' ability/skills in providing this care.

**28. In preterm or low birth weight newborns, is a standing transfer safer than a seated transfer?**

Quality of evidence: LOW

Strength of recommendation: WEAK. It should be taken into consideration the parents' ability, preterm newborn stability, and technique standardization when choosing between standing or seated transfer.

**29. How to provide a safe transfer for a preterm newborn with invasive or non-invasive mechanical ventilation?**

Quality of evidence: LOW and EXPERT CONSENSUS

Strength of recommendation 1: WEAK. For intubated patients, it is recommended NOT TO DISCONNECT the patient from the ventilator during the transfer. It is recommended for at least two people to assist in the transfer, with one managing the tubing and the other managing the endotracheal tube (ETT).

Strength of recommendation 2: WEAK. It is suggested to place the tubing on the same side of the incubator to facilitate KMC without disconnecting any equipment.

Strength of recommendation 3: WEAK. It is recommended to place the tubing over the shoulder of the KMC provider.

Strength of recommendation 4: WEAK. There should be allowed slight slack when securing the tubing allowing for newborn movement.

Strength of recommendation 5: WEAK. Ensure the fixation is accessible and easily removable in case of an emergency.

**30. Is using a containment nest the best way to transfer a preterm newborn?**

Quality of evidence: LOW and EXPERT CONSENSUS

Strength of recommendation: WEAK. For a seated transfer from incubator to the KMC provider, a containment nest is recommended as it may reduce stress, maintain temperature stability, provide containment, and optimize vestibular development.

**31. Are there alternatives to the conventional prone position for KMC in hospitalized preterm newborns?**

Quality of evidence: MODERATE

Strength of recommendation: WEAK. Alternative KMC positions to prone, such as diagonal prone and vertical side-lying, are suggested. Diagonal prone KMC may foster mother-baby interaction, while vertical side-lying helps maintain normothermia, stable heart rate, and oxygen saturation in extremely preterm newborns during the first five days of life.

Quality of evidence: EXPERT CONSENSUS

Strength of recommendation: WEAK. It is suggested to use a mirror or front camera on a mobile device to view the preterm newborn's face.

**32. Does the prone position in KMC increase the risk of developing IVH compared to the lateral position in KMC or lateral position in an incubator for hospitalized preterm newborns?**

Quality of evidence: MODERATE

Strength of recommendation: WEAK. The vertical lying sideways position is suggested as an alternative to the prone position during KMC in preterm newborns during the first 72 hours of life.

**33. Does the position used in KMC influence motor neurodevelopment in preterm newborns?**

Quality of evidence: MODERATE

Strength of recommendation: STRONG. Conventional vertical position KMC improves short-term electromyographic activity.

**34. Does feeding tolerance improve in preterm newborns fed in the kangaroo position?**

Quality of evidence: LOW

Strength of recommendation: WEAK. Feeding during KMC may improve feeding tolerance.

## SECTION 5. FACILITATORS AND BARRIERS TO KANGAROO CARE

### 35. Does a nurse/patient ratio in neonatal units, adjusted to the European average, improve the frequency and/or duration of providing KMC?

Evidence quality: HIGH and EXPERT CONSENSUS.

Recommendation strength 1: STRONG. Adjusted nurse/patient ratio workload should be considered in a neonatal unit to facilitate the implementation and duration of KMC.

Recommendation strength 2: WEAK. It is suggested to encourage parental training and their inclusion into the care teams to optimize time, continuity and quality of care.

### 36. Does the presence of an institutional guideline or protocol on KMC increase the percentage of neonates receiving KMC or the duration of KMC?

Evidence quality: HIGH.

Recommendation strength: STRONG. It is recommended to have an institutional guideline or protocol to enhance KMC implementation and application.

### 37. In hospitalized neonates, does family support structure have an impact on the frequency, duration and continuity of KMC?

Evidence quality: HIGH.

Recommendation strength: STRONG. It is recommended to provide the family with cultural and/or religious support in the neonatal units. The associated costs of NICU admissions, inadequate staff and staff sick leave may interfere with KMC.

### 38. Does specific space and furniture design and layout in neonatal units increase the frequency of KMC implementation?

Evidence quality: HIGH.

Recommendation strength: STRONG. It is recommended to establish private areas or rooms where both parents can stay with the hospitalized preterm neonate (PTN) and allow 24-hour access to the unit. Lack of space, privacy, and appropriate resources can interfere with KMC frequency.

### 39. Does the professional competence of nurses perceived by parents of neonates eligible for KMC increase their willingness to provide KMC?

Evidence quality: HIGH.

Recommendation strength: STRONG. Positive perceptions of professional competence are recommended as they may increase parents' willingness to perform KMC. On the contrary, lack of information and support, along with negative perceptions of competence may hinder their willingness to provide KMC.

### 40. Does the degree of level of specific competence among neonatal nurses affect the perception of needs/usefulness and inclination to provide/propose KMC?

Evidence quality: MODERATE.

Recommendation strength: STRONG. It is recommended to promote KMC training for neonatal nurses and other professionals involved in the care of PTN to facilitate KMC implementation.

**41. Does the perception of clinical severity of the patient among neonatal nursing staff influence in providing KMC?**

Evidence quality: HIGH.

Recommendation strength: STRONG. It is recommended to consider the importance of neonatal nurses' perceptions regarding the clinical severity of the neonate, especially in situations with a low nurse/patient ratios, as this may have a significant impact on KMC implementation.

**42. In parents of neonates eligible for KMC, does the perception of the patient's clinical severity improve willingness to provide KMC?**

Evidence quality: HIGH.

Recommendation strength: STRONG. Parents' perceptions of their neonate's clinical severity influence the frequency of KMC. Maternal health issues and cesarean deliveries act as barriers in providing KMC and its duration.

**43. Does the existence of an institutional support network promote KMC?**

Evidence quality: HIGH.

Recommendation strength: STRONG. It is recommended to provide institutional support to healthcare professionals to facilitate KMC implementation.

**SECTION 6. EXTREME PREMATURITY AND KANGAROO MOTHER CARE**

**44. Is it safe to perform KMC in extremely preterm newborns?**

Evidence quality: LOW and EXPERT CONSENSUS.

Recommendation strength 1: STRONG. KMC is recommended for extremely preterm newborns as soon as possible.

Recommendation strength 2: WEAK. It is suggested to provide KMC with a polyethylene bag to prevent hypothermia, at least during the first week of life for preterm newborns, individualizing each case and always maintaining skin-to-skin contact.



## 1. INTRODUCTION

### 1.1. Definitions, Background, and Types

Kangaroo Care is an evidence-based care strategy that involves placing a newborn (NB) or infant, dressed only in a diaper and/or baby bonnet, in a vertical position directly on skin-to-skin contact on the bare chest of the mother, father, or caregiver with the infant positioned ventrally, with his/her head turned to one side, and arms and legs flexed <sup>1,2</sup>. The kangaroo position is part of the Kangaroo Mother Care (KMC) method, which, according to the latest World Health Organization (WHO) guidelines, is defined as: “early, continuous and prolonged skin-to-skin contact between the mother (or other caregiver) and the baby; exclusive breastfeeding (EBF); and early home discharge” <sup>3</sup>.

This Clinical Practice Guideline (CPG) focuses on proving KMC.

KMC is recommended for newborns during their stay in neonatal units, advising that it should start as early as possible and be provided as frequently and for as long as possible <sup>4</sup>, allowing most healthcare procedures and interventions to be carried out during KMC <sup>1</sup>.

KMC methods are categorized based on their mode of application, either continuous or intermittent and according to when KMC is initiated which can be immediate, earliest, early or late.

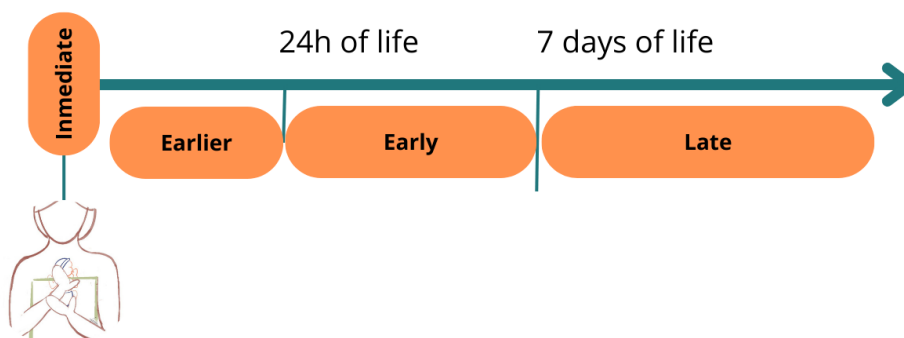
Based on its mode of application, KMC can be <sup>4</sup>:

- Continuous KMC: if an infant is hospitalized for 24 hours, it is preferable for the infant to be with the mother, as she can provide feeding; or,
- Intermittent KMC: if an infant is in the neonatal unit, KMC can be provided by the mother, father or caregiver during a more or less extended period of time, over a variable number of days.
- Prolonged KMC is defined as that provided for at least 8 hours a day.

Based on the moment of initiation (Figure 1), KMC can be <sup>4,5</sup>:

- Immediate: started within the first hour of life;
- Earlier: initiated within the first 24 hours of life;
- Early: initiated within the first 7 days of life;
- Late: initiated after the first 7 days of life.

FIGURE 1. DEFINITIONS ACCORDING TO THE MOMENT OF INITIATING KMC.



Source: Authors' own elaboration

## 1.2. Justification

Despite its benefits and recommendations on an international level, the implementation of Kangaroo Mother Care (KMC) in neonatal services remains highly variable. Significant variations have been observed as to when to initiate KMC, as well as the criteria for proving, the duration and the frequency, and the necessary equipment needed. These variations could influence in reducing the beneficial outcomes of KMC and significantly impact the quality and safety of care provided to this population. Therefore, it is essential to have a Clinical Practice Guideline (CPG) that consolidates KMC implementation practices based on scientific evidence, which has been elaborated following a systematic process.

## 1.3. Target Population

This CPG is intended for providing care to all preterm (PT) and/or low birth weight (LBW) newborns admitted to a neonatal unit, whether they require basic, intermediate, or intensive care and in any healthcare architectural setting (ward, family room, Couplet Care Room).

## 1.4. Healthcare Setting

These recommendations are directed solely for a hospital setting.

## 1.5. Description of the Care Process

Through this CPG, healthcare professionals and staff members attending newborns will be able to carry out KMC correctly and in a step-by-step clinical manner. The clinical questions addressed by this document were formulated using the PICO (population, intervention, comparison, outcome) method.

## 1.6. Types of Decisions

With this CPG, healthcare professionals will be able to select an individualized care plan for each newborn receiving KMC and provide the family with relevant and up-to-date information for its implementation. The recommendations will be based on scientific and technical aspects related to the application of KMC.

## 1.7. Development for Clinical Management

The CPG includes a concise, user-friendly section with clinical recommendations following a literature review. Additionally, a panel of experts was created using the Delphi method to address controversial aspects of KMC, aiming to provide specific solutions and improve decision-making in these areas.

## 2. OBJETIVES

The objectives of this Clinical Practice Guideline (CPG) are:

- To increase: healthcare professionals' knowledge about the impact of Kangaroo Mother Care (KMC), the candidates participation in providing KMC, implementation, training and education provided to the family, by issuing KMC care recommendations and standards.
- To equip healthcare professionals with the correct tools and care standards necessary for the implementation of KMC.
- To compile the latest information and recommendations based on the most recent scientific evidence regarding KMC, with the aim of improving the quality of care provided to neonatal patients and their families

## 3. METHODOLOGY

### 3.1. Formation of the Guideline Development Group (GDG)

The Guideline Development Group (GDG) was formed by the signing authors, who were selected based on their knowledge and clinical experience on the topic. The methodological coordinators were Laura Collados Gómez and Isabel M<sup>a</sup> Fernández Medina.

The members of the GDG come from various backgrounds, including: pediatric nurse specialists; clinical nurses with an expert level in neonatology; academic nurses; and healthcare professionals involved in neonatal care. Professionals from both university and clinical settings, as well as premature infants parents associations, also contributed to the review and subsequent validation of this guideline.

### 3.2. Conflict of Interest

No member declared any type of interest, whether economic, non-economic, professional, or through close relatives or friends.

### 3.3. Development Design

The methodology used to develop this CPG followed the guidelines described in detail in the Methodological Manual for the Development of Clinical Practice Guidelines (CPG) of the National Health System, available at [www.guiasalud.es/](http://www.guiasalud.es/) (Aragonese Institute of Health Sciences-I+CS; 2016) <sup>6</sup>.

The main stages in the development process were:

1. Establishing the Guideline Development Group (GDG). The group was formed with a team of expert professionals sharing common concerns about the care of hospitalized neonates, particularly regarding KMC. (As used by the International Council of Nurses (ICN), in this CPG, the term "nurse" is intended to refer to both male and female professionals)
2. Formulation and prioritization of clinical questions following the PICO format: Population, Intervention, Comparison, and Outcome.
3. Systematic literature search in databases such as the Database of Systematic Reviews (The Cochrane Library), Medline (via PubMed), CINAHL, and Scopus. Priority was given to identifying randomized controlled trials (RCTs) and other summary documents of the scientific literature. Additionally, documents published by Scientific Societies, as well as publications by entities such as WHO, UNICEF, and

the Kangaroo Foundation, were consulted. The search was conducted using MeSH (Medical Subject Headings) terms and natural language (Table 1. Documentary Language. Supplementary Material). These terms were combined with the Boolean operators "AND," "OR," or "NOT," following a different search strategy according to the subsections of this CPG. Subsequently, a specific search for individual studies was conducted to update relevant systematic reviews and answer the CPG questions for which literature was not identified in the previous stage. Primarily, RCTs and observational studies were identified. These searches were conducted in English and Spanish. The initial searches began in September 2022 and were continually updated until September 2023 to capture high-impact studies throughout the CPG development process.

4. After locating evidence through the literature search, working groups within the GDG reviewed the selected documents in pairs, with a third person resolving any discrepancies.
5. Each working group extracted information from each selected document. The literature screening was conducted independently by two researchers according to inclusion and exclusion criteria, using the CASPe (Critical Appraisal Skills Programme Español) tool or, for descriptive studies, the MINCIR group's tool. Each clinical question was answered independently, prioritizing high-quality evidence and the most recent publications. A synthesis of evidence was prepared for each key question. In cases of limited literature or controversial recommendations, these were resolved through joint consultations with experts, specifically with the GDG via the Delphi Method, conducted in two rounds. The topics addressed with this methodology included:
  - Safety of KMC in extremely premature patients
  - Exclusion criteria for KMC
  - KMC in patients with NIPPV: need for tubing disconnection during transfer, tubing fixation
  - Transfer with nest
  - The use of baby bonnets during KMC

The GRADE (Grade of Recommendation, Assessment, Development and Evaluation) system was used to assess the quality of the scientific evidence included in the CPG, classified into four levels: high, moderate, low, and very low.

Furthermore, recommendations were rated by strength, either Weak or Strong. Strong (high confidence) is defined as the action benefiting most or all individuals; Weak (uncertainty) indicates that not all individuals would benefit from the recommended action<sup>7</sup>.

6. GDG members participated in the formulation and prioritization of questions, as well as in the development and review of the first version of the CPG. External reviewers participated in the second version. The Spanish Association of Parents of Premature Infants (APREM) was also contacted.

## BIBLIOGRAPHY

1. Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Vol. 2016, Cochrane Database Syst Rev.2016; 2016 (8): CD002771.
2. Boundy EO, Dastjerdi R, Spiegelman D, Fawzi WW, Missmer SA, Lieberman E, et al. Kangaroo Mother Care and Neonatal Outcomes: A Meta-analysis. *Pediatrics*. 2016; 137(1):e20152238.
3. World Health Organization. Kangaroo mother care: a practical guide. Geneva: World Health Organization; 2003.
4. World Health Organization. WHO recommendations for care of the preterm or low- birth-weight infant. Gêneva; 2022.
5. Sivanandan S, Sankar MJ. Kangaroo mother care for preterm or low birth weight in- fants: a systematic review and meta-analysis. *BMJ Glob Health*. 2023;8(6):e010728.
6. Instituto Aragonés de Ciencias de la Salud (IACS). Elaboración de Guías de Práctica Clínica en el Sistema Nacional de Salud. Actualización del Manual Metodológico. Mi- nisterio de Sanidad SS e I, editor. Zaragoza; 2016.
7. Andrews JC, Schünemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA, et al. GRADE guidelines: 15. Going from evidence to recommendation—determinants of a recommendation’s direction and strength. *J Clin Epidemiol*. 2013;66(7):726-35.