

New WHO recommendations for the care of preterm or low birthweight infants have the potential to transform maternal and newborn health-care delivery



The incidence of preterm birth (gestational age <37 weeks) worldwide was 15.2 million in 2019, occurring in 11% of livebirths.^{1,2} In 2015, an estimated 20.5 million livebirths globally were low birthweight (LBW; weight <2500g at birth).³ The survival, health, growth, and neurodevelopment of preterm and LBW infants lags behind that of full-term infants and special care is needed for these vulnerable infants.^{4,5} Preterm and LBW infants are susceptible to impaired respiration, difficulty feeding, growth failure, poor body temperature regulation, and infection.^{4,5} Globally, preterm birth accounts for 36.1% of neonatal deaths and 17.7% of deaths among children younger than 5 years.⁶ Complications of preterm birth are the leading cause of death in children before their fifth birthday. An

estimated 0.94 million deaths worldwide were due to preterm birth in 2019.⁶

The Departments of Maternal, Newborn, Child and Adolescent Health and Ageing and Sexual and Reproductive Health and Research at WHO developed three guidelines for improving preterm birth outcomes in 2011, 2012, and 2015.⁷⁻⁹ Since then, substantial new evidence has emerged on the effectiveness of interventions for care of preterm or LBW infants.¹⁰ In 2020, WHO convened a Guideline Development Group of 25 experts (all of whom are authors of this Comment) to assess the evidence and develop new recommendations for care of preterm or LBW infants. Interventions were prioritised if: the underlying condition had a high clinical or public health burden;

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Panel 1: WHO's 11 new recommendations and good practice statement for care of preterm or low birthweight infants

Recommendation on immediate KMC

KMC for preterm or LBW infants should be started as soon as possible after birth

Recommendation on probiotics

Probiotics may be considered for human-milk-fed preterm infants <32 weeks' gestation

Recommendation on emollients

Application of topical oil to the body of preterm or LBW infants may be considered

Recommendation on CPAP immediately after birth

CPAP therapy may be considered immediately after birth for very preterm infants <32 weeks' gestation, with or without respiratory distress

Recommendation on CPAP pressure source (bubble CPAP)

For preterm infants <37 weeks' gestation who need CPAP therapy, bubble CPAP may be considered rather than other pressure sources (eg, ventilator CPAP)

Recommendation on methylxanthines for apnoea treatment

Caffeine is recommended for the treatment of apnoea in preterm infants <37 weeks' gestation

Recommendation on methylxanthines for extubation

Caffeine is recommended for the extubation of preterm infants <34 weeks' gestation

Recommendation on methylxanthines for apnoea prevention

Caffeine may be considered for the prevention of apnoea in preterm infants <34 weeks' gestation

Recommendation on family involvement

Family involvement in the routine care of preterm or LBW infants in health-care facilities is recommended

Recommendation on family support

Families of preterm or LBW infants should be given extra support to care for their infants, starting in health-care facilities from birth, and continued during follow-up post-discharge. The support may include education, counselling, and discharge preparation from health workers, and peer support

Recommendation on home visits

Home visits by trained health workers are recommended to support families to care for their preterm or LBW infant

Best practice statement on parental leave and entitlements

Parental leave and entitlements should address the special needs of mothers, fathers, and other primary caregivers of preterm or LBW infants

KMC=kangaroo mother care. LBW=low birthweight. CPAP=continuous positive airway pressure.

guidance was non-existent or conflicting; new evidence was likely to change or update recommendations; or if a recommendation would lead to an important change in clinical practice or programme design across countries. 17 new systematic reviews were commissioned and 21 additional existing systematic reviews and meta-analyses were assessed. Recommendations were based on effects (benefits and harms) on preterm or LBW infant outcomes, certainty of the evidence, the values of families and health workers, acceptability, resource requirements, feasibility, and equity.

On Nov 15, 2022, WHO published the outcomes of this process in the *WHO Recommendations for Care of the Preterm or Low Birthweight Infant*.¹¹ There are 11 new recommendations and one new best practice statement (panel 1) that reflect a fundamental change in the way care for mothers and their newborn infants is conceptualised and should be provided in the future.

Strong, high-certainty evidence was found for kangaroo mother care (KMC; the care of preterm or LBW infants in continuous and prolonged skin-to-skin contact with support for exclusive breastfeeding or breastmilk feeding) to be provided to all preterm or LBW

infants. Previously, KMC recommendations were only for stable babies born in health facilities. Now, for the first time, WHO recommendations include the initiation of KMC as soon as possible after birth for all preterm or LBW infants, including those born at home or in a health facility, except if the infant is unable to breathe spontaneously after resuscitation, is in shock, or needs mechanical ventilation.

The WHO recommendations call for a “re-positioning of power” within health systems, allowing the mother and family to take the pivotal role in their baby’s care. Families need to be empowered and supported to take their central place as providers of care for their preterm and LBW infants, including right from the time of birth. Mothers and newborn babies should remain together from birth and not be separated, even if the preterm or LBW newborn is sick or requires intensive care, unless the baby is critically ill. The recommendations also call for improvements in family support, including education and counselling, peer support, and home visits by trained health workers. A new good practice statement underlines the importance of parental leave and entitlements for the care of their preterm or LBW baby.

Panel 2: Priority research questions for care of preterm or low birthweight infants

KMC

What is the effectiveness of immediate KMC in critically ill preterm or LBW infants, such as infants who are mechanically ventilated or on blood pressure support (eg, vasopressors)? How can immediate KMC be scaled-up in routine health systems?

Probiotics

What is the effectiveness and safety of probiotics on mortality, morbidity, growth, immunological status, gut microbiome, and development outcomes in human milk fed preterm or LBW infants?

- What are the optimal compositions (ie, the optimal combination of genera, species, and strains?)
- What is the optimal dosage and duration?
- What is the effectiveness of probiotics alone compared with a combination of prebiotics and probiotics?
- What is the role of probiotics in prevention and management of postnatal growth restriction in preterm infants?

Emollients

What is the effect of emollients on mortality, sepsis, growth, thermoprotection, microbiome, and longer-term neurodevelopment of preterm or LBW infants in high-income, middle-income, and low-income countries, especially in Africa?

- Which emollients (which products, what composition) are most effective and safe?
- What is the optimal regime (dose, frequency, and duration) and mode of application (eg, non-touch applications) for very or extremely preterm infants?

Family involvement

What strategies can be used to increase family participation in the care of their preterm or LBW infants in intensive and special care units, and in settings without dedicated newborn units?

Family support

What is the most effective type of family support (including education, counselling, discharge preparation, and peer support) for families of preterm or LBW infants?

Home visits

What is the effectiveness of standard in-person home visits compared with digital home visits (eg, online video, mobile-application, and m-Health) for post-discharge follow-up of preterm or LBW infants?

KMC=kangaroo mother care. LBW=low birthweight. CPAP=continuous positive airway pressure.

Other changes included recommendations for probiotics for gut microbiome health during infancy, emollient therapy to support skin barrier function, and methylxanthines (particularly caffeine) for prevention and treatment of apnoea and for extubation. The importance of early initiation of the mother's own milk and exclusive breastfeeding to 6 months was also reinforced, and several other feeding and micronutrient supplementation recommendations were updated, including supplementation with iron, zinc, vitamin D, and vitamin A.

However, there are important evidence gaps and priority research questions that need to be addressed (panel 2). Research is needed on the effectiveness of immediate KMC in critically ill preterm or LBW infants, who are currently excluded from the recommendation due to scarce evidence. The cost-effectiveness of scaling up immediate KMC in routine health systems is unknown. Research is also needed to determine: the optimal probiotic genera, species, and strains; which emollients are most effective and safe; effective strategies to increase family support and participation in care; and the effects of standard in-person compared with digital home visits for post-discharge care.

Overall, the new WHO recommendations will help ensure preterm and LBW infant survival, health, and wellbeing. However, implementation of the recommendations at scale requires changes in health-systems building blocks,¹² including innovations in policy, infrastructure, workforce, service delivery, financing, and measurement. WHO and UNICEF are analysing benchmarks and norms and developing implementation guidance for KMC and for field testing of the recommendations in level 2 special care units in district hospitals. WHO is also updating core derivative tools, including the Integrated Management of Childhood Illnesses (IMCI) chart booklet; the WHO Pocket Book of Hospital Care for Children; and the WHO Small and/or Sick Newborn Care (SSNC) training courses.¹³⁻¹⁵

Integrating the new WHO recommendations into maternal and child health systems requires commitment and concerted action, including structural changes to place mothers and families at the centre of care, commitment by political and programme leadership, dedicated funding in national maternal and child health programmes, and the development and implementation of a monitoring and evaluation framework to track

progress. Rigorous implementation of the WHO recommendations is likely to transform maternal and newborn health-care delivery across all countries.

The authors include members of an independent, international panel of experts convened by WHO (Guideline Development Group [GDG]) that formulated the WHO recommendations for care of preterm or lowbirth weight infants discussed in this Comment (GLD [Co-chair], NHA), SA, MB, LC-T, QF, PFR, RUH, ZH, AAI, CK, VNK, RK, SDL-M, SM, KM, RM, MM, SN, SR, MS, HTT, ADW, BW, KY, VKP [co-chair]); the WHO Secretariat (RB, DC, VC, KE, LG-S, SG, AP, SR), who supported the GDG but did not take part in the formulation of the recommendations; and the external methodologist (RC) who provided external independent advice to the GDG and secretariat. MM is the President/Legal Director of the Asociación Latinoamericana de Seguimiento Pediátrico y Neonatal. RC reports consulting fees from WHO and the payments are made to him and his institution. SM is a member of European Foundation for the Care of Newborn Infants (EFCNI) Trustee Board and the EFCNI Executive Board; participation in both EFCNI boards is non-paid. CK reports CEO Council of International Neonatal Nurses (COINN). Secretary, Health Care Professionals Associations (HCPA), Partnership for Maternal Newborn and Child Health (PMNCH). The authors declare no other competing interests.

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