



Guidelines on

Optimal feeding of low birth-weight infants in low-and middle-income countries

2011

Avec résumé d'orientation en Français



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CONTENTS

	Page
Acknowledgements	I
Abbreviations and glossary	II
Executive summary	1
Résumé d'orientation	5
Introduction	9
Scope of the guidelines	11
Methodology	14
Recommendations	20
Field testing of guidelines	50
Implementation plan	50
References	51

Annexes

- 1 Detailed GRADE profiles summarizing evidence**
- 2 Summary of individual research studies which formed the basis of recommendations**

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ABBREVIATIONS AND GLOSSARY

CI	Confidence interval
CLD	Chronic lung disease
DARE	Cochrane database of abstracts of reviews of effectiveness
dl	Decilitre
ELBW	Extremely low birth weight
ES	Effect size
g	Gram
GDG	Guideline development group
GRADE	System for grading the quality of evidence and the strength of recommendations
HIV	Human immunodeficiency virus
IMCI	Integrated management of childhood illness
IMPAC	Integrated management of pregnancy and childbirth
IQ	Intelligence quotient
i.u.	International unit
kg	Kilogram
l	Litre
LBW	Low birth weight
mg	Milligram
ml	Millilitre
MD	Mean difference
NEC	Necrotizing enterocolitis
OR	Odds ratio
Palladai	Cup with a beak
PICO	Population, intervention, comparison, outcome
RCT	Randomized controlled trial
RDA	Recommended daily allowance
ROP	Retinopathy of prematurity
RR	Relative risk
SD	Standard deviation
SGA	Small for gestational age
TPN	Total parenteral nutrition
VLBW	Very low birth weight
WHO	World Health Organization
WMD	Weighted mean difference

EXECUTIVE SUMMARY

Low birth weight (LBW) has been defined by the World Health Organization (WHO) as weight at birth less than 2500 g. The global prevalence of LBW is 15.5%, which means that about 20.6 million such infants are born each year, 96.5% of them in developing countries. There is significant variation in LBW rates across the United Nations regions, with the highest incidence in South-Central Asia (27.1%) and the lowest in Europe (6.4%).

LBW can be a consequence of preterm birth (defined as birth before 37 completed weeks of gestation), or due to small size for gestational age (SGA, defined as weight for gestation <10th percentile), or both. In addition, depending on the birth weight reference used, a variable but small proportion of LBW infants are born at term and are not SGA. Intrauterine growth restriction, defined as a slower than normal rate of fetal growth, is usually responsible for SGA. LBW thus defines a heterogeneous group of infants: some are born early, some are born at term but are SGA, and some are both born early and SGA.

Being born with LBW is generally recognized as a disadvantage for the infant. LBW infants are at higher risk of early growth retardation, infectious disease, developmental delay and death during infancy and childhood.

Countries can substantially reduce their infant mortality rates by improving the care of LBW infants. Experience from developed and low- and middle-income countries has clearly shown that appropriate care of LBW infants, including feeding, temperature maintenance, hygienic cord and skin care, and early detection and treatment of complications, can substantially reduce mortality in this highly vulnerable group. Interventions to improve feeding are likely to improve the immediate and longer-term health and well-being of the individual infant and have a significant impact on neonatal and infant mortality levels in the population. Better feeding was one of the first interventions for preterm babies in the 1960s in the United Kingdom and was associated with reduced case fatality in hospitals before the advent of intensive care.

The objective of these guidelines is to improve the quality of care received by LBW infants in developing countries through improved capacity of health workers. These guidelines focus on the feeding of clinically stable LBW infants in low- and middle income countries. They do not specifically address the feeding of infants with a birth weight less than 1.0 kg (known as extremely LBW, ELBW), who are often clinically unstable and may require parenteral nutrition. Guidance on the management of clinically unstable infants is addressed in other WHO documents.

The guideline development group identified 18 research questions to be of the highest priority for development of recommendations. Most of the questions are relevant to all LBW infants (birth weight less than 2.5 kg) but some are specific to very LBW (VLBW) infants (birth weight less than 1.5 kg). The questions do not specifically address ELBW infants. For each question, the following four outcomes were considered to be critical: *mortality, severe morbidity, neurodevelopment and anthropometric status*. Benefits and harms in critical outcomes formed the basis of the recommendations for each question.

Studies from developing and developed countries that included infants with a birth weight less than 2500 g or gestation less than 37 weeks were considered for inclusion in this review. Efforts were made to identify relevant non-English language articles and abstracts also.

A standardized form was used to extract relevant information from studies. Systematically extracted data included: study identifiers, setting, design, participants, sample size, intervention or exposure, control or comparison group, outcome measures and results. The following quality characteristics were recorded for all studies: allocation concealment or risk of selection bias (observational studies), blinding of intervention or observers or risk of measurement bias, loss to follow up, intention to treat analysis or adjustment for confounding factors, and analysis adjusted for cluster randomization (the latter only for cluster-randomized controlled trials, RCTs).

We used a modified GRADE approach for assessing the quality of evidence and the recommendations (for details, see **Methodology** section). The quality of the set of included studies reporting results for an outcome was graded as: high, moderate, low or very low.

The strength of a recommendation reflects the degree of confidence that the desirable effects of adherence to a recommendation outweigh the undesirable effects. The decisions were made on the basis of evidence of benefits and harms; quality of evidence; values and preferences of policy-makers, health-care providers and parents; and whether costs are qualitatively justifiable relative to benefits in low- and middle- income countries.

Each recommendation was graded as **strong** when there was confidence that the benefits clearly outweigh the harms, or **weak** when the benefits probably outweigh the harms, but there was uncertainty about the trade-offs. A strong or weak recommendation was further classified as **situational** if the benefits outweigh the harms in some situations but not in others. For example, some recommendations were considered relevant only to settings in low- and middle-income countries where resources were very limited (e.g. Recommendations 3, 4, 5 and 12) while others were considered relevant only to settings where certain types of facilities were available (e.g. Recommendations 2 and 17).

2011 WHO Recommendations on optimal feeding of low-birth-weight infants

No	Recommendation*	Type of recommendation	Quality of evidence (at least 1 critical outcome)
What to feed?			
a. Choice of milk			
1.	Low-birth-weight (LBW) infants, including those with very low birth weight (VLBW), should be fed mother's own milk.	<i>Strong</i>	<i>Moderate</i>
2.	LBW infants, including those with VLBW, who cannot be fed mother's own milk should be fed donor human milk (recommendation relevant for settings where safe and affordable milk-banking facilities are available or can be set up).	<i>Strong situational</i>	<i>High</i>
3.	LBW infants, including those with VLBW, who cannot be fed mother's own milk or donor human milk should be fed standard infant formula (recommendation relevant for resource-limited settings). VLBW infants who cannot be fed mother's own milk or donor human milk should be given preterm infant formula if they fail to gain weight despite adequate feeding with standard infant formula.	<i>Weak situational</i>	<i>Low</i>
4.	LBW infants, including those with VLBW, who cannot be fed mother's own milk or donor human milk should be fed standard infant formula from the time of discharge until 6 months of age (recommendation relevant for resource-limited settings).	<i>Weak situational</i>	<i>Low</i>
5.**	VLBW infants who are fed mother's own milk or donor human milk should not routinely be given bovine milk-based human-milk fortifier (recommendation relevant for resource-limited settings). VLBW infants who fail to gain weight despite adequate breast-milk feeding should be given human-milk fortifiers, preferably those that are human milk based.	<i>Weak situational</i>	<i>Low</i>
b. Supplements			
6.**	VLBW infants should be given vitamin D supplements at a dose	<i>Weak</i>	<i>Very low</i>

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