Nutrition eLearning for preterm and low birthweight infants in Africa

The African Neonatal Nutrition Network (NeoNuNet) has developed an online eLearning course on feeding and nutrition that aligns with the World Health Organization policy and guidelines. It provides free educational resources relevant to nurses, dietitians, doctors, and other healthcare professionals working on a neonatal unit as well as parents. It covers a range of subjects including kangaroo mother care, breastfeeding, nutrient recommendations, probiotics, feeding practice and guideline development. The course was co-developed (**TABLE 1**) with clinicians based in Africa and while it is aimed at middle and low income settings in Africa, Asia and Latin America, it is equally relevant in high income settings in the UK, Europe and North America.

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Keywords

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Key points

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1. Nutrition in Preterm and Low Birthweight Infants in Africa is a free evidenced-based eLearning course.
2. The content contains unbiased, up-to-date and evidenced-based recommendations for nutrients.
3. It is relevant to high, middle and low income countries and aligns with WHO and UNICEF guidelines on kangaroo mother care and breastfeeding.

Global risks of poor nutrition in LBW and premature infants

Globally more than 20 million babies (one in seven) are born low birth weight (LBW) or premature in whom the risks of death or serious disability are higher than infants born at full term. Many of these infants suffer from under-nutrition while in hospital, which increases the risk of death, resource use (including antibiotics), laboratory tests and duration of hospital stays. Under-nutrition also worsens short-term morbidities, such as sepsis, and results in poorer longer-term outcomes such as poor cognitive development or disability. Research has shown that there is a lack of high-quality education on neonatal nutrition; a precursor to further research studies.

NeoNuNet aims to improve outcomes for preterm and LBW infants by improving their nutritional care in early life. To

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TABLE 1 Nutrition in Preterm and Low Birthweight Infants in Africa: the course developers.

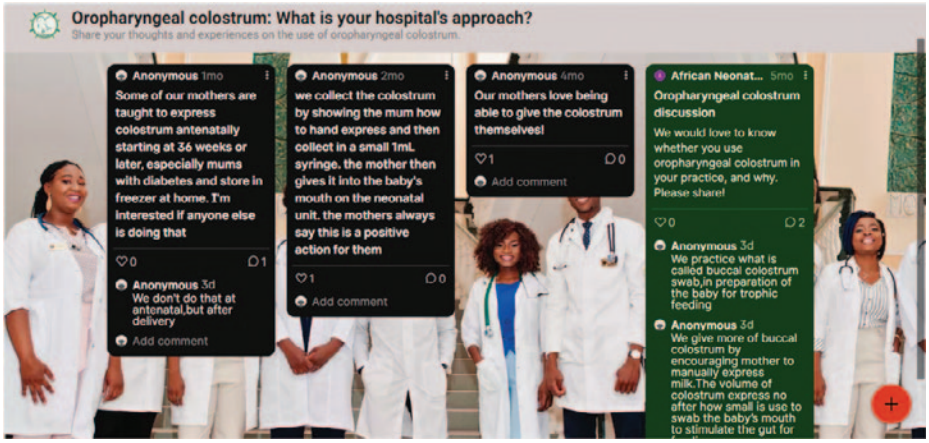

FIGURE 1 The interactive forum.

Module	Topics
Module 1 – Introduction	• Global perspective of nutrition in LBW and preterm infants • Kangaroo mother care (**FIGURE 2**) • Dietary nutrient requirements
Module 2 – Breast milk	• Composition and benefits • Oropharyngeal colostrum • Donor milk and formula • Fortification • Sensory aspects of feeding
Module 3 – Feeding methods	• Cup and spoon; gastric tube feeding • Starting and increasing milk feeds • Gastric residuals (**FIGURE 3**) • Expressing breast milk • Establishing breastfeeding
Module 4 – Growth and nutrients	• Growth monitoring and resources • Management of slow growth • Macronutrients – protein, fat and carbohydrates • Minerals, electrolytes, trace elements and vitamins • Necrotising enterocolitis and probiotics (**FIGURE 4**)
Module 5 – Guidelines and parents	• Holistic ABCDE nutritional assessment* • Guidelines, audit and quality improvement • Role of parents and family-integrated care • Planning for discharge

TABLE 2 The course modules and topics.*Nutritional assessment for use on the neonatal unit summarised as ABCDE: A=anthropometry, B=biochemistry, C=clinical, D=dietary intakes, E=environment and evaluation.

achieve this, NeoNuNet works with health, nutrition, other allied professionals and parents to co-create new knowledge and promote best practice in neonatal nutrition in Africa and other similar contexts.

Course development and partnerships

The development of Nutrition in Preterm and Low Birthweight Infants in Africa was supported by an award from the UK Research and Innovation (UKRI) Global Challenges Research Fund (GCRF) and Newton Fund Consolidation Accounts (GNCA). A website was created to host the course (africanneonatalnutrition.net) along with other learning materials, webinars and an interactive forum (**FIGURE 1**). The course is a partnership between Newcastle University and Aga Khan University, Nairobi, Kenya, with input from clinicians in five other African countries. It has wide stakeholder and community involvement by partnering with professional organisations and parent-led advocacy organisations.

Membership of the African NeoNuNet is free and open to all healthcare professionals, students, and academics, although it excludes anyone working for the formula milk industry.

The course was developed by

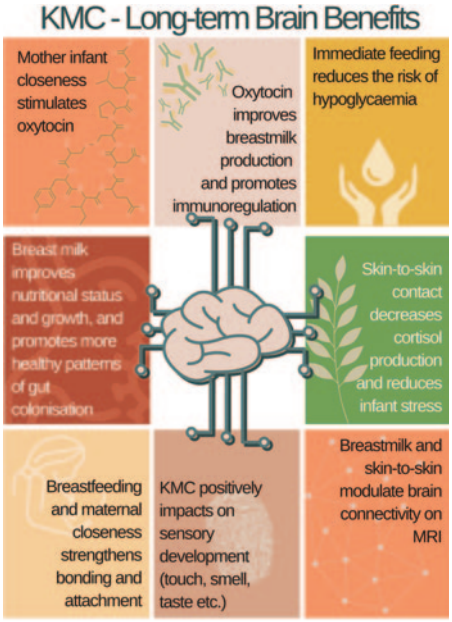

FIGURE 2 Module 1: Kangaroo mother care (KMC).

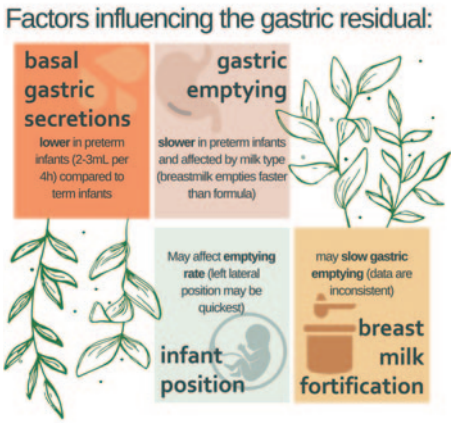

FIGURE 3 Module 3: Feeding methods – gastric residuals.

paediatricians, neonatologists and nurses who are clinical leaders in Kenya, Nigeria, The Gambia, Uganda, Zambia and Malawi. The content includes downloadable resources, references, and links to relevant national and international websites. It is fully aligned with World Health Organization (WHO) and UNICEF policies and recommendations and includes quizzes to assess and test baseline knowledge and skills. Course production and website creation was led by Page Medical (pagemedical.co.uk).

Learning topics

The course provides evidence-based recommendations for neonatal nutrition with a focus on clinical practice in Africa. The nutritional needs of preterm and LBW infants in a hospital setting are considered alongside advice on preparation for discharge and ongoing nutritional needs.

Emphasis is placed on the critical role of mother's own breast milk to reduce mortality and improve outcomes, and the importance of kangaroo mother care. The course is broken down into five modules that each take around 40-60 minutes to complete. Each module consists of a series of steps which are made of short text summaries, graphics, interactive case studies, quizzes, etc. A brief overview of the modules and topics is provided in **TABLE 2**.

Summary

Poor nutrition in preterm and LBW infants increases the risk of death and sepsis and worsens long-term growth, metabolic and cognitive outcomes. Support for kangaroo mother care and mother's own milk is vital, but this requires a good understanding of the principles of nutritional needs and how to provide this in clinical practice. While resources vary widely across the world, the basic principles upon which this course is founded are the same. With four hours of online learning eligible for continuing professional development (CPD), continuing medical education (CME), or continuing nurse education (CNE), the course is relevant to everyone working on neonatal units across the UK and further afield. What's more, it is completely free… come and join us!

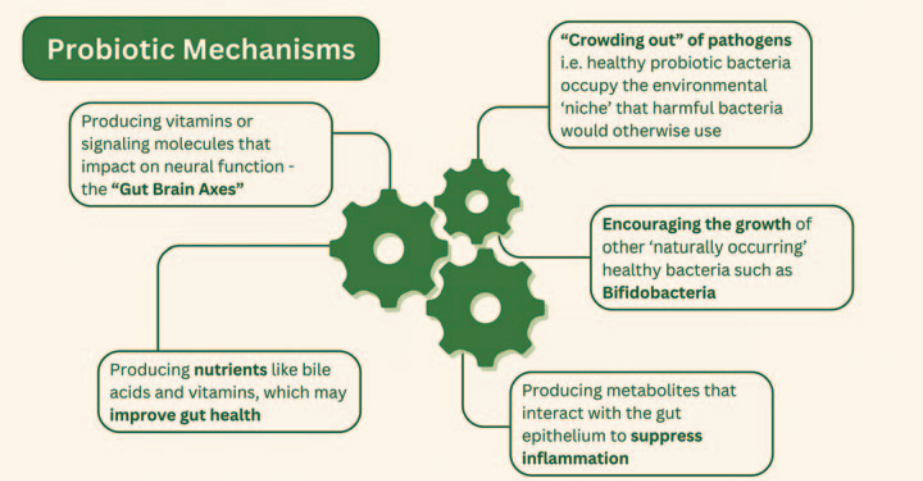

FIGURE 4 Module 4: Growth and nutrients – probiotics.

To find out more about the African Neonatal Nutrition Network (NeoNuNet) and take the online eLearning course, visit africanneonatalnutrition.net or scan the QR code.

RESEARCH NEWS

Fortification enhances the bioactive properties of human milk

Human milk fortification is recommended for the nutritional optimisation of very low birthweight infants. According to a study published in *Breastfeeding Medicine*,[1] a human milk-derived fortifier (HMDF) significantly improves human milk's nutritional content and bioactive proteins (higher protein, fat, total solids and antioxidant activity). Furthermore, donor human milk (DHM), which has reduced bioactive properties compared to mothers' own milk (MOM), can be enhanced through HMDF supplementation.

The authors analysed the biochemical and immunochemical characteristics of MOM (fresh and frozen) and DHM supplemented with either HMDF or cow's milk-derived fortifier. They conclude that freshly expressed MOM fortified with HMDF given early, enterally and exclusively is an optimal nutritional choice for extremely premature infants.

PReCePT improves $MgSO_4$ uptake in maternity units

The Preventing Cerebral Palsy in Pre-Term labour (PReCePT) quality improvement (QI) intervention was developed to improve maternity staff awareness and increase magnesium sulphate ($MgSO_4$) uptake, as it is known to reduce the risk of cerebral palsy in preterm births.

A report in *BJOG*[2] discusses the National PReCePT Programme's (NPP) project, which gave eligible maternity units QI materials (clinical guidance, training), regional support and midwife backfill funding as standard support. Some units received enhanced support – all this plus extra backfill funding and unit-level QI coaching.

The investigators found that $MgSO_4$ uptake increased in all maternity units over the study period. Enhanced support did not further improve uptake but those units receiving it reported better understanding, engagement and perinatal teamwork.

MIST reduces adverse respiratory outcomes

Delivery of surfactant via a thin catheter (minimally invasive surfactant therapy, MIST) is known to improve survival without bronchopulmonary dysplasia (BPD) in preterm infants. BPD has lasting effects on respiratory health and may be associated with a greater risk of neurodevelopmental disability (NDD) throughout childhood – interventions to reduce BPD frequency could produce lasting benefit on neurodevelopment and/or respiratory health.

A recent study published in *JAMA*,[3] set out to examine the long-term effects of MIST on death or NDD at two years' corrected age. The follow-up study of a randomised clinical trial conducted in 33 neonatal intensive care units in 11 countries included 486 infants of 25-28 weeks' gestation, supported with continuous positive airway pressure (CPAP).

The results showed that MIST did not reduce the incidence of death or NDD; however, infants who received MIST (n=242) had lower rates of adverse respiratory outcomes during their first two years of life, including hospitalisation for respiratory illness and parent-reported wheezing or breathing difficulty.

References

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