Incorporating nutrition into delivery care: delivery care practices that affect child nutrition and maternal health

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Abstract

Delayed umbilical cord clamping, early skin-to-skin contact and early initiation of exclusive breastfeeding are three simple and inexpensive delivery care practices which have the potential to improve short-term and long-term nutrition and health outcomes in mothers and infants. In preterm infants, delayed clamping prevents intraventricular haemorrhage and improves haematological status, and in full-term infants, delayed clamping improves iron status through 6 months of age. Early skin-to-skin contact, in addition to regulating neonatal temperature, improves early breastfeeding behaviours, which has important implications for long-term infant nutrition and health. Finally, early exclusive breastfeeding prevents neonatal mortality and morbidity and provides numerous health and nutritional benefits to the infant, throughout infancy and beyond, as well as to the mother. Though each practice has been the subject of controlled trials and systematic reviews, with evidence of benefit from their implementation, these practices are not common in many delivery settings, nor are their long-term effects on infant and maternal nutrition and health status adequately recognized. We discuss the immediate and long-term health and nutrition benefits of each practice, and identify the policy and programme changes needed for integration and implementation of these practices into standard delivery care.

Keywords: newborn, nutrition, iron deficiency, breastfeeding, umbilical cord clamping.

Introduction

Delivery and the immediate post-partum period is a vulnerable time for both the mother and infant. During the first 24 h after delivery, approximately 25–45% of neonatal and 45% of maternal deaths occur (Li et al. 1996; Lawn et al. 2005). Thus, delivery and post-partum care practices that attend to the most serious and immediate risks for the mother [e.g. post-partum haemorrhage (PPH) and infections] and neonate (e.g. asphyxia and severe infections) are most commonly addressed by public health interventions. However, a crucial opportunity to implement simple delivery care practices that can positively impact immediate and long-term nutrition, health and development is being overlooked. Delayed umbilical cord clamping (i.e. clamping at the end of cord pulsations, approximately 2–3 min after birth), immediate mother to newborn skin-to-skin contact and early initiation of exclusive breastfeeding are three simple practices that, in addition to providing immediate benefit, can have a long-term
impact on the nutrition and health of both mother and child, and possibly affect the development of the child far beyond the neonatal and post-partum period. Thus, an integrated package of care that includes these three practices, together with maternal and neonatal care practices already being promoted to prevent morbidity and mortality, will optimize both short-term and long-term infant and maternal outcomes.

The objective of this document is to draw on the existing literature and systematic reviews to present evidence for the immediate as well as long-term nutritional and health benefits of delayed clamping, early skin-to-skin contact and initiation of exclusive breastfeeding (Fig. 1). While we recognize that there are other ‘nutrition-related’ delivery care practices that deserve attention (e.g. neonatal vitamin A dosing), we intentionally limited our discussion to these three practices because they need to occur in the moments when the mother and newborn are still united or just shortly after their first separation. Thus the ‘responsibility’ for their implementation tends to fall into the divide between what is traditionally considered ‘maternal/obstetric’ care and what is considered ‘neonatal’ care. Shared support for and knowledge of these practices are needed from both sides of this divide – both obstetricians and paediatricians, both safe motherhood and neonatal health programmes – and from those who typically bridge this divide – midwives and nurses. In addition, the benefits of these three practices go beyond neonatal survival, which has frequently been the endpoint of most reviews of cost-effective and effective packages of delivery interventions (Darmstadt et al. 2005). While neonatal survival is an important goal, ignoring practices that could improve the newborn’s chance at a healthy and productive future is a tragically missed opportunity. Therefore, we conclude with a discussion of possible opportunities for implementation of these three practices into policy and practice so that they are effectively, universally and sustainably integrated into standard delivery care.

Methodological approach

Several recent meta-analyses/systematic reviews on the short-term and long-term effects of delayed cord clamping, skin-to-skin contact and breastfeeding (for both mother and infant) were used as primary sources of research articles for this review (Hutton & Hassan 2007; Ip et al. 2007; Moore et al. 2007; Rabe et al. 2007; McDonald & Middleton 2008). Additional articles were obtained using the ‘snowball’ technique from the articles cited in these reviews, or from previous literature written by the first author, or by Medline searches of the terms ‘umbilical cord clamping’ ‘skin-to-skin contact’ and ‘breastfeeding initiation’ for articles published since the publication date of the meta-analyses.

A centuries-old debate: the optimal timing of umbilical cord clamping

Debate as to the ‘correct’ time to clamp the umbilical cord after birth has been documented in the scientific literature since at least the early 1900s, when obstetric practices shifted from delayed clamping (i.e. 2–3 min after birth or at the end of cord pulsations), towards...
### Practice

<table>
<thead>
<tr>
<th>Immediate physiological effect</th>
<th>Short-term outcomes</th>
<th>Long-term outcomes</th>
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<td><strong>Delayed umbilical cord clamping</strong></td>
<td>Provides adequate blood volume and birth iron stores</td>
<td>Preterm infants improves haematological status (haematocrit and haemoglobin), decreases risk of intraventricular haemorrhage and late-onset sepsis and need for blood transfusions and mechanical ventilation</td>
<td>Improves iron status through 6 months of age (term infants) and haematological status through 10 weeks of age (preterm infants)</td>
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<td><strong>Skin-to-skin contact</strong></td>
<td>Elicits prefeeding behaviour in the infant and stimulates maternal oxytocin release</td>
<td>Improves effectiveness of first breastfeed and reduces time to effective suckling; regulates/maintains infant temperature and promotes maternal/infant bonding</td>
<td>Improves breastfeeding outcomes at 1–4 months of age</td>
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<tr>
<td><strong>Early initiation of exclusive breastfeeding</strong></td>
<td>Provides early immunological factors and nutrition; early suckling stimulates maternal oxytocin release</td>
<td>Prevents neonatal morbidity and mortality. Stimulation of maternal oxytocin release stimulates uterine contractions, possibly decreasing maternal bleeding</td>
<td>Improves long-term breastfeeding behaviour including length of total and exclusive breastfeeding</td>
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**Fig. 1.** Summary of important short-term and long-term outcomes of each recommended practice.
early umbilical cord clamping (i.e. 10–15 s after birth), the current and prevalent practice in many settings. Many factors played a role in the change, including an overall movement in obstetrics towards more ‘interventionist’ techniques which included the movement of more births from the home into the hospital setting where ‘ligation of the cord makes it possible to get babies and mothers out of the delivery room more rapidly’ (Montgomery 1960). Other reasons that have been suggested for early clamping include: the fear of increasing hyperbilirubinaemia and/or polycythaemia in the late-clamped infant, the presence of a neonatologist or paediatrician in the delivery room anxious to attend to the infant, the rush to measure cord blood pH and gases, and to place the infant in skin-to-skin contact with the mother as soon as possible (Philip & Saigal 2004). Regardless of the particular reasons behind the change in practice, it is clear that there was little to no scientific evidence justifying early clamping as the more beneficial practice for the infant or mother.

For a period of time after birth, there is still circulation between the infant and placenta through the umbilical vein and arteries; thus, the timing of cord clamping will have profound effects on infant blood volume at birth. Whether this ‘additional’ blood volume provided by delayed clamping has negative effects (e.g. increased risk of polycythaemia and jaundice) or positive effects (e.g. adequate blood volume at birth, improved haematological and iron status in infancy) has been disputed throughout the last century, but recent systematic reviews indicate that depriving the newborn of this ‘placental transfusion’ through early clamping has negative effects on both immediate and long-term outcomes in both preterm and full-term infants (Hutton & Hassan 2007; Rabe et al. 2007; McDonald & Middleton 2008).

Immediate negative effects of early clamping may be more readily evident in preterm/low-birthweight (LBW) infants because of their smaller foetal-placental blood volume. A recent randomized controlled trial of the effect of a 30–45 s delay in cord clamping as compared with early clamping (5–10 s) in newborns less than 32 weeks gestation, found a significantly lower incidence of intraventricular haemorrhage and late-onset sepsis in the delayed-clamped infants (Mercer et al. 2006). Two meta-analyses of delayed clamping in preterm and LBW infants also demonstrated a preventive effect on intraventricular haemorrhage (Rabe et al. 2004, 2007). Early clamping may increase the risk of intracranial bleeding by causing hypotension, which has been shown to be a risk factor for intraventricular haemorrhage (Watkins et al. 1989). Although further research is needed, it has been proposed that the increased incidence of late-onset sepsis following early clamping could be because of a loss of protective primitive haematopoietic progenitor cells (in which cord blood is very rich) resulting in a compromised immune response (Mercer et al. 2006). Sepsis is estimated to contribute to approximately one quarter (23%) of neonatal deaths globally (Lawn et al. 2006). Other immediate benefits of delayed clamping for preterm/LBW or very LBW infants include higher haematocrit levels (Kugelman et al. 2007), blood pressure (Kugelman et al. 2007) and haemoglobin levels (Ultee et al. 2008), greater tissue oxygen transport (including cerebral oxygenation) (Baenziger et al. 2007) and higher red blood cell flow (Nelle et al. 1998). As delayed clamping in preterm/LBW infants has also been associated with fewer days on oxygen (Kinmond et al. 1993), fewer days on or a decreased need for mechanical ventilation (Kinmond et al. 1993; Kugelman et al. 2007), a decreased need for surfactant (Kugelman et al. 2007) and a decreased need for transfusions for low blood pressure or anaemia (Rabe et al. 2004), it may be particularly important in low resource settings with little access to expensive technology.

The immediate concern with delayed clamping in full-term infants has been related to excessive haematocrit and its potential negative consequences, particularly polycythaemia and hyperbilirubinaemia (i.e. jaundice). Two recent meta-analyses have addressed these outcomes and the effect of clamping time. Hutton and Hassan reviewed 15 controlled trials and found that although delayed-clamped infants did have significantly higher haematocrit through 48 h of life, no clinical signs of polycythaemia were reported (Hutton & Hassan 2007) Clinical symptoms of polycythaemia, which result from hyperviscosity which is sometimes, but not always, associated with
polycythaemia, are generally required to warrant treatment, which may in itself have adverse risks (Dempsey & Barrington 2006). In addition, the same meta-analysis showed that delayed clamping did not significantly increase mean serum bilirubin, the incidence of clinical jaundice or the number of infants requiring phototherapy. McDonald and Middleton, in their review of 11 trials, (some of which were not published and therefore not included in the review by Hutton and Hassan), found that significantly more delayed-clamped infants required phototherapy for jaundice than early-clamped infants (5% vs. 3%) (McDonald & Middleton 2008); however, the criteria for application of phototherapy in the included studies were not provided.

Few studies on the timing of cord clamping have included maternal outcomes as primary outcomes. Because earlier protocols for active management of the third stage of labour for the prevention of PPH included early clamping as a component (Prendiville et al. 1988) – a step which has since been removed [World Health Organization (WHO) 2007] – there is frequently the concern that the timing of cord clamping affects the amount of maternal bleeding. There is no evidence to support this. Three recent randomized controlled trials did not show a significant difference in the measured (Ceriana Cernadas et al. 2006) or estimated (Chaparro et al. 2006; van Rheenen et al. 2007) amount of maternal blood loss by clamping time, nor a significant difference in prenatal or postnatal maternal haemoglobin levels (van Rheenen et al. 2007). McDonald and Middleton’s review of the cord clamping literature showed similar results: the timing of cord clamping was not associated with blood loss at delivery, length of third stage of labour or need for manual removal of the placenta (McDonald & Middleton 2008).

While the immediate benefits of delayed clamping are evident, especially for preterm/LBW infants, the positive effects of a 2–3 min delay in umbilical cord clamping at birth are still visible up to 6 months later. Delayed clamping, by providing adequate blood volume at birth, ensures adequate iron stores for the infant which are very important for preventing iron deficiency and anaemia during infancy (Dewey & Chaparro 2007). Up to 50% of infants in developing countries are estimated to become anaemic by 1 year of age (Gillespie & Johnston 1998), although estimates in many countries well exceed that number, and roughly half of anaemia is estimated to be caused by iron deficiency. Iron deficiency during infancy, even without anaemia, has been shown to negatively affect motor development (Shafir et al. 2008), and anaemia caused by iron deficiency is associated with poorer cognitive, motor and/or social/emotional outcomes (Lozoff & Georgieff 2006; Lozoff et al. 2006). In some studies, negative developmental effects are evident more than 19 years later, even after treatment to correct the anaemia (Lozoff et al. 2006). Thus, prevention of iron deficiency in infancy is of significant social and economic importance. Eight studies have examined the effect of the timing of cord clamping on haematological and iron status outcomes in full-term infants beyond the first weeks of life, several of which were included in a recent systematic review (Hutton & Hassan 2007). The authors of the review concluded that a delay in clamping of the umbilical cord for a minimum of 2 min was beneficial for long-term infant haematological and iron status (i.e. through 2–6 months of age). The most recent randomized controlled trial included in the meta-analysis by Hutton and Hassan showed that infants whose cords were clamped at approximately 1 1/2 min after birth had significantly higher iron status at 6 months of age than infants whose umbilical cords were clamped immediately (approximately 17 s after birth) (Chaparro et al. 2006). At 6 months of age, in comparison to early-clamped infants, body storage iron was greater in delayed-clamped infants by approximately the equivalent of 1–2 months of iron requirements. Infants at higher risk of developing iron deficiency during infancy (e.g. infants with birthweight between 2500–3000 g, or born to mothers with iron deficiency) derived a significantly greater benefit from a delay in cord clamping than those born to iron-replete mothers or those born with birthweight above 3000 g. Few studies have examined long-term outcomes in preterm/LBW infants. In one study of 37 infants of gestational age between 34 and 36 weeks, infants randomly assigned to receive clamping at 3 min after birth had signi-
significantly higher haemoglobin concentrations at 10 weeks of age, compared with the early-clamped group (mean of 13 s after birth) (Ultee et al. 2008). Though additional research is needed to fully examine the long-term effects of clamping time in preterm infants, it is likely that these infants would receive significant long-term benefit from delayed cord clamping because of their increased risk of developing iron deficiency and anaemia.

Mother and newborn skin-to-skin contact: not just for premature/low-birthweight infants

Although particularly promoted for temperature regulation of LBW infants (e.g. ‘Kangaroo mother care’), skin-to-skin contact between mother and newborn (i.e. placing the naked infant, prone, on the mother’s bare chest or abdomen, and covering both with a warm blanket) is likely beneficial for all infants because of its positive effects on breastfeeding, infant temperature regulation and maternal-infant bonding, all essential components of neonatal and infant survival and health. Early skin-to-skin contact between the mother and her infant assists in the adaptation of the newborn to life outside of the womb, and promotes immediate breastfeeding by eliciting organized ‘prefeeding behavior’ in which the infant first begins spontaneous sucking and rooting movements and then localizes the breast, attaches to the nipple and begins to suckle (Widstrom et al. 1987; Varendi et al. 1994), often without particular assistance (Righard & Alade 1990; Moore et al. 2007). Routine newborn care practices such as bathing and measuring the newborn may negatively affect early contact between mother and infant (Awi & Alikor 2004) and initiation of breastfeeding (Awi & Alikor 2006), as continuous uninterrupted skin-to-skin contact has been shown to improve the success of the first breastfeed (Righard & Alade 1990). A recent randomized controlled study showed that infants who were placed in skin-to-skin contact with their mother for an average of 1.5 h, starting in the first minute post-birth, had significantly more successful breastfeeding scores for the first latch and a shorter time to begin effective breastfeeding than infants who had been swaddled in blankets and held (Moore & Cranston Anderson 2007). Because breast milk production is determined by how frequently the infant suckles and empties the breast, early, frequent and effective nursing is important for both establishing milk production and preventing excess neonatal weight loss (Dewey et al. 2003). As ‘insufficient milk’ is a very common reason given by mothers for abandoning breastfeeding or supplementing breast milk with formula or other liquids (Ahluwalia et al. 2005), the effect of skin-to-skin contact on establishing early effective breastfeeding has implications for short-term and long-term breastfeeding outcomes. In fact, a recently updated Cochrane review on skin-to-skin contact also showed long-term benefits to breastfeeding from early skin-to-skin contact including breastfeeding status at 1–4 months post-partum and total duration of breastfeeding (Moore et al. 2007).

Independent of its role in establishing breastfeeding, early skin-to-skin contact also provides benefits to both the mother and infant. Thermal control is an essential component of preventing neonatal morbidity (Bhutta et al. 2005), particularly in LBW infants, and skin-to-skin contact provides an inexpensive, safe and effective method for maintaining newborn temperature. Skin-to-skin contact has been shown to be as effective as incubator care for re-warming of hypothermic infants (Christensson et al. 1998), and infants placed in skin-to-skin contact with their mother were significantly warmer than infants placed in cots (Christensson et al. 1992) likely because of the thermal response of maternal skin temperature in reaction to skin-to-skin contact with her infant thought to be mediated by oxytocin (Bergström et al. 2007). Therefore, initiating early skin-to-skin contact will help to support the establishment of breastfeeding, while at the same time, prevent neonatal hypothermia.

Ensuring immediate survival and long-term health and nutrition: early initiation of exclusive breastfeeding

The importance of breastfeeding for infant nutrition and the prevention of infant morbidity and mortality as well as the prevention of long-term chronic diseases is well established, and thus, breastfeeding is an

essential component of infant and child survival and health programmes. The impact of breastfeeding on neonatal and child survival was recently quantified in an analysis of mortality data from 42 countries which contributed to 90% of worldwide child deaths in 2000 (Jones et al. 2003). Of the interventions studied, it was estimated that exclusive breastfeeding for the first 6 months followed with continued breastfeeding from 6–11 months of age was the single most effective intervention for preventing child mortality, estimated to prevent 13% of all under-five deaths. Therefore, establishing breastfeeding immediately (i.e. within the first hour after birth) is crucial for immediate survival, but also for long-term nutrition and health outcomes for both mother and infant (Horta et al. 2007).

Beginning breastfeeding immediately ensures that the newborn receives colostrum, often referred to as the infant’s ‘first immunization’, because of its rich content of important immune factors, anti-microbial and anti-inflammatory agents, and Vitamin A, all important for immediate and long-term protection from infections. Human milk as the exclusive food for the newborn prevents the introduction of disease-causing pathogens through contaminated liquids (including formula) or foods; prevents gastrointestinal damage, which makes pathogen entry easier; and prevents clinical and sub-clinical gastrointestinal blood loss, which can negatively impact infant nutritional status, especially iron status. A recent study in Ghana estimated that early initiation of breastfeeding could reduce all-cause neonatal mortality by 22% and newborns fed with breast milk exclusively were four times less likely to die (Edmond et al. 2006). In another study from a rural area of the Gambia, use of pre-lacteal feeds was associated with a 3.4 higher odds of neonatal death (Leach et al. 1999).

In addition to their direct effects on neonatal survival, early breastfeeding behaviours also help to establish longer-term breastfeeding patterns. Early exclusive breastfeeding has been associated with exclusive breastfeeding later in infancy (Chandrashekhar et al. 2007) and the time of the first breastfeed has been shown to positively relate to the overall duration of breastfeeding (Rautishauser & Carlin 1992; Lawson & Tulloch 1995; Ekstrom et al. 2003).

Maintaining exclusive breastfeeding for 6 months followed by continued breastfeeding until the child is 2 years old or beyond, as recommended by WHO (World Health Assembly 18 May 2001), has clear health and nutritional benefits for the infant for continued prevention of disease and provision of adequate nutrition. A history of being breastfed has been associated with decreased risk of acute otitis media, non-specific gastroenteritis, hospitalization for severe lower respiratory tract infections, atopic dermatitis, asthma in young children, obesity, type 1 and 2 diabetes, childhood leukaemia, sudden infant death syndrome and necrotizing enterocolitis (Ip et al. 2004).

For the mother, early suckling in the immediate post-partum period stimulates endogenous oxytocin release (Matthiesen et al. 2001), inducing uterine contraction (Chua et al. 1994) which may reduce maternal bleeding. Furthermore, establishment of breastfeeding and continued frequent on-demand nursing of the infant helps to delay future pregnancies and protect maternal nutritional status through lactational amenorrhoea. Exclusive breastfeeding also accelerates post-partum weight loss (Dewey 2004), which could be a considerable benefit, in light of increasing rates of overweight and obesity in the developing world. Finally, a longer lifetime duration of breastfeeding has also been associated with a decreased maternal risk of type 2 diabetes, ovarian and breast cancer (Ip et al. 2007).

Opportunities for integration and implementation of the three practices into standard delivery care

In order for these practices to be implemented successfully as standard care, several steps are essential: (1) the development of integrated delivery care guidelines that address the care of both mother and newborn simultaneously; (2) increased awareness of the importance of these practices, not only by those attending deliveries (and those that will attend deliveries in the future) but also by mothers; and (3) removal of institutional and other barriers to implementation.

Developing and instituting integrated delivery care protocols, such as that presented in Appendix S1,
which recognize both parts of the mother–newborn dyad simultaneously will provide a more continuous approach to delivery care and should be developed and distributed at the international level. An integrated approach establishes that neonatal and maternal care practices are not in conflict or in competition with one another. As an example, in 2007, revisions were made by the WHO to the protocol for active management of the third stage of labour (WHO 2007), the main strategy to prevent PPH, to recommend delayed clamping. Previous protocols had recommended early clamping, along with oxytocin injection and delivery of the placenta by controlled cord traction, though there were little to no data supporting the inclusion of early cord clamping as an important step for prevention of PPH (Prendiville et al. 1988). Recognizing the importance of delayed cord clamping within active management in the revised guidelines made the newborn a visible part of what had previously been a ‘mother-centered’ protocol. Revisions of other frequently used guidelines, such as the international guideline for newborn resuscitation (Kattwinkel et al. 1999), would align essential newborn procedures with recommended practices for the mother. Ultimately, development and testing of an integrated sequence of steps that combines the revised recommended practices (Chaparro & Lutter 2007), along with other beneficial practices in a feasible manner for different delivery settings and with a variable number of attendants, is necessary.

Increasing awareness of the integrated practices will be an important next step. Of the three practices discussed, delayed clamping of the umbilical cord may suffer from the least recognition as an essential delivery care practice. From limited data, the timing of cord clamping tends to be immediate in many settings: early clamping was practiced 79% of the time in 15 university-based obstetrical care centres in 10 countries (from North and South America, Africa, Asia and Europe) (Festin et al. 2003) and in 68–90% of delivery units in Belgium, France, Ireland, Italy, the Netherlands, Portugal, Spain, Switzerland and the UK (Winter et al. 2007). Unfortunately, among many individuals involved in maternal health and familiar with previous active management protocols, the view remains that delayed cord clamping is a practice that will harm mothers. Thus, widespread distribution of the revised active management guidelines is urgently needed. Another strategy for increasing awareness of these practices is to introduce them into medical, nursing and midwifery curricula and national guidelines, to increase knowledge among future health practitioners, especially in regions where access to current scientific literature is limited. For current medical practitioners, a reinvestment in health centre or hospital-based strategies, such as the baby-friendly hospital initiative (BFHI) implemented by WHO and the United Nations Children’s Fund in the early 1990s which increased knowledge of the importance of breastfeeding among health workers, is necessary. However, for this implementation to be effective and permanent, a one-sided approach addressing only the knowledge of medical practitioners may not be sufficient. Particularly in developing countries, pregnant women may have little to no input or knowledge of the delivery care practices which are employed in their care, even if those practices are overly aggressive medically, or of no benefit (or even of potential harm) to their own or their infant’s health. Increasing women’s knowledge of the importance of appropriate care practices for their own health and that of their newborn, as well as improving their options for expressing their needs and desires during the delivery (e.g. through written birth plans and improved patient/provider communication) needs to occur on a broad level.

Unfortunately, achieving awareness of the benefits of the desired practices may not necessarily ensure their implementation; the barriers that health-care practitioners perceive in their practice and in the environments in which they work will also need to be overcome. There are few data on the barriers to adopting ‘evidence-based’ practices in perinatal care, however, a qualitative study of Latin American physicians and midwives indicated that perceived barriers to changes in practice included limited access to information, negative attitudes towards changes in practice, lack of skills in new practices, lack of medical resources and explicit guidelines, and a perceived need to practice defensive medicine (Belizan et al. 2007). These perceived barriers, which are primarily
focused on the practitioner’s acquisition of knowledge and skills and his/her interactions with others, will need to be addressed in developing guidelines and educational materials such as the ones discussed in this document so that health practitioners can effectively overcome these barriers. However, not as clearly mentioned in the above list of barriers are more ‘environmental’ or structural factors of the hospital or health-care centre that may prohibit the implementation of the recommended practices. The environment in which delivery occurs is an important component to ensure the implementation of these practices. The BFHI created a hospital environment that was supportive of breastfeeding by eliminating hospital practices detrimental to breastfeeding (e.g. use of artificial nipples and free formula distribution, use of formula or other liquids); the same model should be adapted to create an environment that is supportive of other essential care practices. For example, the care of mothers and infants that occurs in the hospital setting is frequently divided, both in terms of the individuals caring for each individual (obstetrician vs. paediatrician), and the actual physical location where care is provided (nursery vs. post-partum ward). This ‘occupational’ division of care can be detrimental to the practice of delayed cord clamping – if the obstetrician feels pressured or anxious to ‘hand-off’ the newborn to the paediatrician – and the physical separation of care can be detrimental to skin-to-skin contact and breastfeeding if the mother and newborn are not permitted to be together. An integrated approach to caregiving, such as that promoted and practised by midwives, where the same individual is involved in the care of mother and newborn (thus exemplifying the ‘continuum of care’ approach) needs to be more strongly encouraged in the hospital setting. A supportive environment needs to be accompanied by a supportive staff, trained in the recommended practices and focused on the mother and newborn as a unit that should remain together.

Conclusions
The importance of appropriate delivery care practices for immediate survival and health of both the mother and newborn is now well recognized; however, less attention has been paid to the potential long-term ramifications of simple practices implemented in the moments surrounding birth. While increasing neonatal survival is a vital goal, it is clearly not enough; we need to look beyond survival to a healthy and productive future for every infant. Developing policies and programmes to ensure that a few simple and inexpensive practices such as delayed clamping, immediate skin-to-skin contact and early initiation of exclusive breastfeeding are the standard of care, will be one step towards providing infants with the best start to long-term health and nutrition.

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Conflict of interest
We declare no conflict of interest.

References


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