

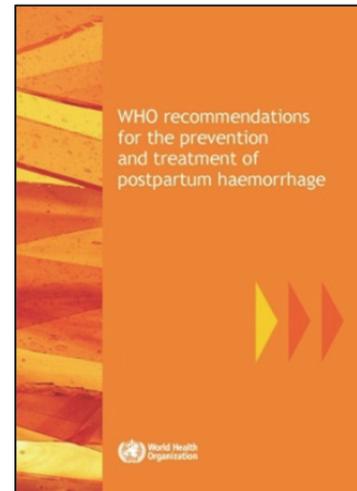
DELAYED CLAMPING OF THE UMBILICAL CORD TO REDUCE INFANT ANAEMIA

World Health Organization Recommends Delayed Cord Clamping

Late cord clamping (performed after 1 to 3 minutes after birth) is recommended for all births while initiating simultaneous essential newborn care.

The problem: Anaemia in children, with a major cause being iron deficiency, causes increased child mortality as well as impaired cognitive, motor and behavioural development.¹ Sixty-eight and 66 per cent of preschool-age children are anaemic in sub-Saharan Africa and Southeast Asia, respectively. Two-thirds of the 293 million preschool-age children with anaemia live in these two regions of the world.²

The intervention: In the recently released 2012 *WHO Recommendations for the Prevention and Treatment of Postpartum Haemorrhage*, WHO reiterates its previous recommendation of waiting to clamp and cut the umbilical cord following the birth of the baby. The recommendation is based on the understanding that a delay in clamping the cord allows continued passage of blood from the placenta to the baby for an additional 1 to 3 minutes after birth. This brief delay is known to increase the iron stores of the young infant by over 50% at 6 months of age among babies born at full-term.³ Currently, however, the coverage for this intervention has been limited due to a lack of information about its benefits as well as concerns about the practice. The purpose of this briefer is to describe the benefits of the intervention and why it is not currently being used, so that **delayed cord clamping** can be enthusiastically supported and promoted as a **best practice by maternal health, newborn health, HIV and nutrition** professionals.



Theoretical Barriers to and Concerns about Delayed Cord Clamping

- **Jaundice (yellowing of the eyes and skin) requiring phototherapy:** Studies show only a 5% risk of jaundice in babies who receive delayed cord clamping, compared to a 3% risk in babies who have early cord clamping. There is no increased risk of severe jaundice.⁴
- **Polycythemia (too many red blood cells causing blood to thicken):** Studies reveal no increased risk of polycythemia when a baby receives delayed cord clamping.⁶
- **HIV:** WHO recommends delayed cord clamping for all women, including HIV-positive mothers and mothers whose HIV status is unknown (see Frequently Asked Questions about Delayed Cord Clamping, page 2).¹
- **Previously unclear clinical guidance on performing DCC:** WHO now recommends integrating delayed cord clamping into essential newborn care and management of the third stage of labour (see Clinical Guidance, page 4).^{1,5}

The Benefits to the Infant of Delayed Cord Clamping

- **Increased iron stores at birth and less infant anaemia:** Studies show a 61% reduction in the rate of anaemia requiring blood transfusion when delayed cord clamping is practiced.⁶
- **Decreased intraventricular haemorrhage:** Studies show a 59% reduction in the rate of intraventricular haemorrhage in preterm infants when delayed cord clamping is practiced.⁵
- **Less necrotizing enterocolitis:** Studies show a 62% reduction in the rate of necrotizing enterocolitis among preterm babies when delayed cord clamping is practiced.⁵
- **Less infant sepsis:** Studies show a 29% reduction in the rate of neonatal sepsis for preterm infants when delayed cord clamping is practiced.⁵
- **Fewer blood transfusions needed:** Studies show a 52% reduction in the rate of blood transfusions for low blood pressure among preterm babies when delayed cord clamping is practiced.⁵

Frequently Asked Questions about Delayed Cord Clamping

HIV

Will delayed cord clamping increase an infant's risk of acquiring HIV from the mother if she has HIV or if her HIV status is unknown?

No, delayed cord clamping does not increase risk to the infant. The WHO 2012 recommendations state that delayed cord clamping is recommended even among women living with HIV or women with unknown HIV status. HIV is vertically transmitted through either micro-transfusions of maternal blood during pregnancy, exposure to blood and mucous membranes during a vaginal delivery, or breastfeeding. During the time between birth and cord clamping, blood flow from the placenta to the newborn baby is the same as during pregnancy. There is no evidence that 1 to 3 minutes of additional placental blood flow after birth increases the possibility of HIV transmission from mother to baby.¹ In these recent WHO recommendations, as in other WHO recommendations, delayed cord clamping is encouraged as a best practice. This should be practiced in the context of other elements of prevention of mother-to-child transmission (PMTCT) of HIV, especially reducing the maternal HIV viral load with antiretroviral drugs during pregnancy, birth and postnatally. In areas with high HIV prevalence, PMTCT protocols should be followed, including antenatal and intrapartum testing and counselling, appropriate maternal and infant prophylaxis and timely referral for additional HIV services.

NUTRITION

How does delayed cord clamping benefit the nutritional status of the infant?

Iron is a critical micro-nutrient in a child's development, from immune function to neurological development. When mothers follow the recommendation to exclusively breastfeed for the first 6 months of life, their breast milk provides only a small amount of iron to the infant. To meet the high requirements for iron during this period of growth and development, the baby depends on his/her iron stores from birth. It is suggested that delayed cord clamping provides up to 75 mg of iron (a 3.5-month supply) in the infant's first 6 months of life, and that the greatest benefit is seen in children born at term to iron-deficient mothers and babies with birth weights of less than 3,000 grams.⁷

Does delayed cord clamping prevent all anaemia in children?

No, there are multiple causes of anaemia in children, including malaria, parasitic worms and diarrhoea, which cause the destruction of red blood cells, loss of iron and increased requirements for iron and other nutrients. Preventing placental malaria and iron deficiency in pregnant women will improve the nutritional status of infants at birth (i.e., malaria-control interventions, de-worming and iron folic-acid supplements during pregnancy). Preventing malaria, diarrhoea and other infections in infants younger than 6 months (i.e., sleeping under insecticide-treated bed nets (ITNs) and exclusive breastfeeding) are critical components of a comprehensive anaemia prevention package for infants in their first 6 months. To prevent anaemia in children 6 to 24 months, children need to receive complementary foods rich in iron or iron supplements, and depending on the setting, continue to sleep under ITNs and receive de-worming medication.

Does delayed cord clamping mean one cannot perform active management of the third stage of labour (AMTSL) to prevent postpartum haemorrhage?

No, delayed cord clamping is a component of the current recommendation for AMTSL and should be performed as a part of AMTSL. The new 2012 WHO guidelines give greater guidance on the essential elements of AMTSL, including the use of uterotonics, controlled cord traction only if birth attended by a skilled birth attendant, uterine tone assessment and delayed cord clamping for all babies. The risk of postpartum haemorrhage is no different whether the provider performs early or delayed cord clamping.⁶ Delaying cord clamping by 1 to 3 minutes benefits the baby and does not interfere with the practice of AMTSL.

Does delayed cord clamping benefit preterm infants (born < 37 weeks)?

Yes, infants born prematurely benefit from delayed cord clamping. Delayed cord clamping in preterm babies increases iron stores and decreases the risk of intraventricular haemorrhage, necrotizing enterocolitis and infant sepsis.⁸ The WHO 2012 *Guidelines on Basic Newborn Resuscitation* recommend delayed cord clamping in preterm babies because of these specific benefits to the baby.

Should delayed cord clamping be done for an asphyxiated newborn needing resuscitation?

This practice would depend upon the experience of the provider. The WHO 2012 *Guidelines on Basic Newborn Resuscitation* state that the cord should be clamped and cut to allow for effective ventilation in term or preterm babies requiring positive-pressure ventilation. However, if the clinician has experience in providing effective positive-pressure ventilation without cutting the cord, ventilation can be initiated at the perineum with the cord intact to allow for delayed cord clamping.⁷

Clinical Guidance: Delayed cord clamping (DCC) should be integrated with essential newborn care (ENC) and active management of the third stage of labour (AMTSL).

Steps to integrate DCC, ENC and AMTSL at **vaginal birth** for preterm and term births:

1. Deliver baby and place on mother's abdomen, and initiate immediate ENC—thoroughly dry baby and assess breathing.
2. Immediately, or within 1 minute of delivery, give mother a uterotonic drug (ensure absence of second baby before giving uterotonic).
Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug. A uterotonic should be offered to all women.
3. Delay clamping of the umbilical cord for 1 to 3 minutes following the birth—for all births.*
4. During the 1 to 3 minutes of delay before clamping the cord, continue with ENC—ensure baby is kept dry and warm using skin-to-skin contact on mother's chest, and ensure normal breathing or crying. Cover baby with dry cloth or blanket, including the head (with hat, if possible).*
5. If the cord stops pulsating, or if 3 minutes have passed, clamp the cord. *Note:* If controlled cord traction is to be performed by a skilled birth attendant, it can be performed prior to clamping of the cord.
6. Following delivery of the placenta, assess uterine tone for early identification of uterine atony, and perform uterine massage if atony is present.

Note: If more than one provider is present, some of these steps can be conducted simultaneously.

*Early cord clamping (< 1 minute after birth) should be performed only when the newborn requires resuscitation with positive-pressure ventilation. However, if the provider has experience providing effective positive-pressure ventilation without cutting the cord, ventilation can be initiated with the cord intact to allow for delayed cord clamping.

Steps to integrate DCC, ENC and AMTSL at **caesarean delivery** for preterm and term births:

1. Deliver baby onto sterile operative field, away from surgical site, and initiate immediate ENC—thoroughly dry baby and assess breathing.
2. Immediately, or within 1 minute of delivery, give mother a uterotonic drug.
3. Delay cord clamping (1 to 3 minutes after birth)—for all births.*
4. While waiting 1 to 3 minutes to clamp cord, ensure good visualization of surgical field (clear blood and fluid, use retractors), identify uterine incision edges and corners. Grasp uterine incision edges with ring forceps or clamps if bleeding.
5. Continue with ENC while waiting 1 to 3 minutes to clamp cord—keep baby warm and dry, ensure normal breathing or crying.*
6. Perform controlled cord traction to deliver the placenta.

*Early cord clamping (< 1 minute after birth) should be performed only when the newborn needs to be moved immediately for resuscitation.

¹ Lozoff B et al. 2000. Poorer behavioral and developmental outcome more than 10 years after treatment for iron deficiency anemia in infancy. *Pediatrics* 105: E51.

² de Benoist B et al. 2008. *Worldwide Prevalence of Anaemia 1993-2005*. WHO: Geneva.

³ Chaparro CM et al. 2006. Effect of timing of umbilical cord clamping on iron status in Mexican infants: A randomized controlled trial. *Lancet* 367: 1977-2004.

⁴ McDonald S and Middleton P. 2008. Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes. *Cochrane Database of Systematic Reviews* Issue 2. Art. No.: CD004074. DOI: 10.1002/14651858.CD004074.pub2.

⁵ WHO. 2012. *Guidelines on Basic Newborn Resuscitation*. WHO: Geneva.

⁶ WHO. 2012. *WHO Recommendations for the Prevention and Treatment of Postpartum Haemorrhage: Evidence Base*. WHO: Geneva. Available at: www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/

⁷ Institute of Medicine. 2001. *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. National Academy Press: Washington, DC.

⁸ Rabe H et al. 2012. Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes (Review). *Cochrane Database of Systematic Reviews* Issue 8. Art. No.: CD003248. DOI: 10.1002/14651858.CD003248.pub3.