

Essential delivery care practices for maternal and newborn health and nutrition

The first minutes after birth are a very vulnerable period for both mother and newborn. The care that is provided during this time is critical to ensure not only their immediate survival but also to improve their longer-term health and nutrition. Active management of the third stage of labor (AMTSL), the optimal timing of umbilical cord clamping, early skin-to-skin contact between mother and newborn, and early breastfeeding initiation are safe, effective, feasible and evidence-based care practices that should be offered by a skilled birth attendant to all mothers and their infants in the continuum of maternal-neonatal care.

What are the recommended practices and why are they essential for maternal and infant health and survival?

1. Active management of the third stage of labor (AMTSL)

What is it?

■ AMTSL includes three steps:^{1,2}

- 1) Administration of an uterotonic drug (e.g. 10 IU of oxytocin intramuscularly) soon after delivery of the infant to avoid uterine atony. If oxytocin is not available, 400-600 µg of misoprostol can be given orally.
- 2) Delayed clamping and cutting of the umbilical cord followed by delivery of the placenta by controlled cord traction: After clamping and cutting the cord, keep slight tension on the cord and await a strong uterine contraction. Very gently pull downwards on the cord while stabilizing the uterus by applying counter traction with the other hand placed just above the mother's pubic bone.
- 3) Uterine massage immediately following delivery of the placenta, and every 15 minutes for the first two hours.

Why is it important?

■ Fourteen million cases of postpartum hemorrhage (PPH) are estimated to occur annually on a global level.³ PPH is

the leading cause of maternal mortality worldwide, contributing to 25% of all maternal deaths,³ and uterine atony is the most common cause of PPH.

- AMTSL has been shown to significantly reduce the incidence of PPH from uterine atony by 60%,⁴ the incidence of postpartum blood loss of 1 L or more and the need for costly and risky blood transfusions,¹ and prevent complications related to PPH. **AMTSL can not only help prevent the disability and death of a mother at delivery but also ensure a better chance at survival for her infant, as maternal and neonatal survival are inextricably linked.**

2. Optimal timing of umbilical cord clamping

What is it?

- The optimal time to clamp the umbilical cord for all infants regardless of gestational age or fetal weight is when the circulation in the cord has ceased, and the cord is flat and pulseless (approximately 3 minutes or more after birth).⁵ After the infant is delivered and dried with a clean dry cloth, a fully reactive infant may be placed prone on the maternal abdomen and covered with a warm

dry blanket until cord pulsations cease and the cord is clamped and cut.

Why is it important?

- For the first minutes after birth, there is still circulation from the placenta to the infant, the majority of which occurs within three minutes,⁵ generally coinciding with the end of cord pulsations.
- Clamping the umbilical cord immediately (within the first 10 to 15 seconds after delivery) prevents the newborn from receiving adequate blood volume and consequently sufficient iron stores. **Immediate cord clamping has been shown to increase the incidence of iron deficiency and anemia during the first half of infancy,⁶ with lower birth weight infants and infants born to iron deficient mothers being at particular risk.⁷ Up to 50% of infants in developing countries become anemic by 1 year of life,⁸ a condition which can negatively and perhaps irreversibly affect mental and motor development.⁹ According to one longitudinal study, Costa Rican children with chronic iron deficiency in infancy had 10 to 25 point lower cognitive test scores at 19 years of age, when compared to similar children with adequate iron status.¹⁰ Waiting to clamp the umbilical cord allows a physiological transfer of placental blood to the infant which provides sufficient iron reserves for the first 6 to 8 months of life,¹¹ preventing or delaying the development of iron deficiency until other interventions—such as the use of iron-fortified foods—can be implemented.**
- For premature and low birth weight infants, immediate cord clamping can also increase the risk of intraventricular hemorrhage,^{12,13} and late-onset sepsis.¹³ In addition, immediate cord clamping in these infants increases the need for blood transfusions for anemia and low blood pressure.¹²

3. Early initiation of breastfeeding and mother-to infant skin-to-skin contact

What is it?

- As soon as the newborn is stable and breathing, he/she may be placed on the mother's chest, prone, in skin-to-skin contact, with a warm, dry cloth covering the infant's back and the mother's chest. Routine delivery room procedures (such as cleaning and weighing) should be delayed for at least the first hour.¹⁴

Why is it important?

- In addition to regulating infant temperature¹⁵ and enhancing maternal-infant bonding¹⁶—essential for neonatal survival—immediate and uninterrupted skin-to-skin contact between the mother and infant promotes early initiation of breastfeeding¹⁷ and is associated with a longer duration of exclusive breastfeeding in infancy.¹⁶ **Beginning breastfeeding immediately and exclusively (i.e. within the first hour) is fundamental to survival in the neonatal period¹⁸ and beyond: in Latin America and the Caribbean, it is estimated that 66% of infant deaths due to diarrheal disease and acute respiratory infection occurring between 0 to 3 months of age could be prevented by exclusive breastfeeding.¹⁹ Early breastfeeding also may benefit the mother, as suckling stimulates maternal oxytocin secretion,²⁰ promoting uterine contractions²¹ and possibly reducing maternal bleeding. Routine delivery room practices that separate the mother and infant (such as cleaning and weighing the infant) have been shown to negatively impact early initiation of breastfeeding,²² as continuous, uninterrupted skin-to-skin contact may optimize the baby's success at the first breastfeed.¹⁷ During this period together, health care staff should monitor the condition of both mother and newborn, and provide unobtrusive breastfeeding assistance if necessary, using an approach that takes into account maternal comfort and her desire for modesty.**

In summary

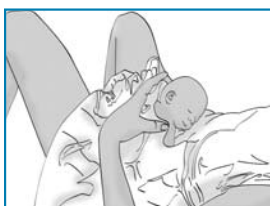
These are *evidence-based, cost-effective, safe and simple* practices to reduce maternal morbidity and mortality and improve newborn and infant survival, health and nutrition.

To whom should these practices be offered?

All mothers should be offered AMTSL and immediate skin to skin contact with their infant after delivery and delayed cord clamping should be considered for every infant except in the case of asphyxiation where early cord clamping may be necessary in order to provide immediate resuscitative measures.

How can these practices be implemented together?

There are still remaining questions as to how to implement AMTSL with optimal cord clamping, in combination with early skin-to-skin contact and initiation of breastfeeding. A proposed sequence of steps based on potential feasibility and the available evidence supporting each practice is presented below. †



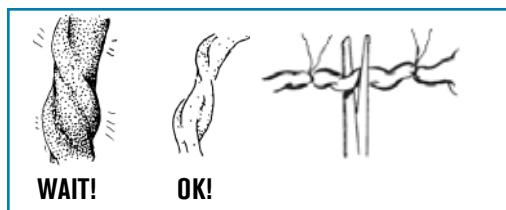
1. After delivery, immediately dry the infant. Then place the reactive infant, prone, on the mother's abdomen.* Keep the infant covered with a dry cloth or towel to prevent heat loss.

**If the infant is pale, limp, or not breathing, it is best to keep the infant at the level of the perineum to allow optimal blood flow and oxygenation while resuscitative measures are performed. Early cord clamping may be necessary if immediate attention cannot be provided without clamping and cutting the cord.*

2. Give oxytocin (10 IU, intramuscularly) soon after delivery.

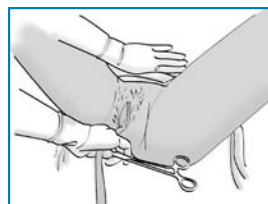


3. After cord pulsations have ceased (approximately 3 minutes after delivery), clamp and cut the cord following strict hygienic techniques.



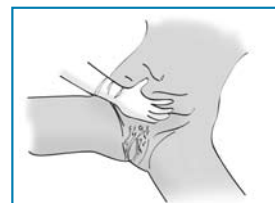
4. Place the infant directly on the mother's chest, prone, with the newborn's skin touching the mother's skin. While the

mother's skin will help regulate the infant's temperature, cover both the mother and infant with a dry, warm cloth or towel to prevent heat loss. Cover the baby's head with a cap or cloth.



5. Deliver the placenta by controlled cord traction on the umbilical cord and counter-pressure to the uterus.

6. Massage the uterus through the abdomen after delivery of the placenta.



7. During recovery, palpate the uterus through the abdomen every 15 minutes for two hours to make sure it is firm and monitor the amount of vaginal bleeding.



8. Aim to delay routine procedures (e.g. weighing, bathing) for at least the first hour so that mother and baby can be together in uninterrupted skin-to-skin contact and begin breastfeeding. If necessary, offer to assist the mother with the first breastfeed, being sensitive to her need for modesty.

†Figures adapted by Martha Cifuentes from "Active management of the third stage of labor (AMSTL)" POPPHI, (available at http://www.pphprevention.org/job_aids.php) and "A Book for Midwives", Hesperian Foundation (available at http://www.hesperian.org/publications_download_midwives.php).

References

1. World Health Organization (WHO). WHO Recommendations for the Prevention of Postpartum Haemorrhage. Geneva: World Health Organization: Department of Making Pregnancy Safer, 2007.
2. World Health Organization (WHO). MPS Technical Update: Prevention of postpartum haemorrhage by active management of the third stage of labour. Geneva: World Health Organization, 2006.
3. World Health Organization (WHO) Department of Reproductive Health and Research. Maternal mortality in 2000: Estimates developed by WHO, UNICEF, and UNFPA. Geneva, 2004.
4. Prendiville WJ, Harding JE, Elbourne DR, Stirrat GM. The Bristol third stage trial: active versus physiological management of the third stage of labour. *BMJ* 1988;297:1295-1300.
5. van Rheen P, Brabin BJ. A practical approach to timing cord clamping in resource poor settings. *BMJ* 2007;333:954-958.
6. Hutton EK, Hassan ES. Late vs. early clamping of the umbilical cord in full-term neonates: systematic review and meta-analysis of controlled trials. *JAMA* 2007;297(11):1241-52.
7. Chaparro CM, Neufeld LM, Tena Alavez G, Eguia-Liz Cedillo R, Dewey KG. Effect of timing of umbilical cord clamping on iron status in Mexican infants: a randomised controlled trial. *Lancet* 2006;367:1997-2004.
8. Gillespie S, Johnston JL. Expert Consultation on Anemia: Determinants and Interventions. Ottawa: The Micronutrient Initiative, 1998.
9. Lozoff B, Georgieff MK. Iron deficiency and brain development. *Semin Pediatr Neurol* 2006;13:158-165.
10. Lozoff B, Jimenez E, Smith JB. Double burden of iron deficiency in infancy and low socioeconomic status: a longitudinal analysis of cognitive test scores to age 19 years. *Arch Pediatr Adolesc Med* 2006;160(11):1108-1113.
11. Dewey KG, Chaparro CM. Session 4: Mineral metabolism and body composition Iron status of breast-fed infants. *Proc Nutr Soc* 2007;66(3):412-422.
12. Rabe H, Reynolds G, Diaz-Rossello J. Early versus delayed umbilical cord clamping in preterm infants. *Cochrane Database Systematic Reviews* 2004;Issue 4. Art. No.: CD003248. DOI: 10.1002/14651858.CD003248.pub2.
13. Mercer JS, Vohr BR, McGrath MM, Padbury JF, Wallach M, Oh W. Delayed cord clamping in very preterm infants reduces the incidence of intraventricular hemorrhage and late-onset sepsis: A randomized controlled trial. *Pediatrics* 2006;117:1235-1242.
14. American Academy of Pediatrics (AAP). Policy Statement: Breastfeeding and the use of human milk. *Pediatrics* 2005;115(2):496-506.
15. Christensson K, Siles C, Moreno L, et al. Temperature, metabolic adaptation and crying in healthy full-term newborns cared for skin-to-skin or in a cot. *Acta Paediatr* 1992;81(607):488-493.
16. Moore ER, Anderson GC, Bergman N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database of Systematic Reviews* 2007;Issue 3.:Art.No.: CD003519. DOI: 10.1002/14651858.CD003519.pub2.
17. Righard L, Alade MO. Effect of delivery room routines on success of first breast-feed. *Lancet* 1990;336:1105-1107.
18. Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusu-Agyei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics* 2006;117:380-386.
19. Betran AP, de Onis M, Lauer JA, Villar J. Ecological study of effect of breast feeding on infant mortality in Latin America. *BMJ* 2001;323(7308):303-306.
20. Matthiesen AS, Ransjö-Arvidson AB, Nissen E, Uvnäs-Moberg K. Postpartum maternal oxytocin release by newborns: effects of infant hand massage and sucking. *Birth* 2001;28(1):13-19.
21. Chua S, Arulkumaran S, Lim I, Selamat N, Ratnam SS. Influence of breastfeeding and nipple stimulation on postpartum uterine activity. *BJOG* 1994;101(9):804-805.
22. Awi DD, Alikor EA. Barriers to timely initiation of breastfeeding among mothers of healthy full-term babies who deliver at the University of Port Harcourt Teaching Hospital. *Niger J Clin Pract* 2006;8(1):57-64.

Acknowledgments

This document was written by Camila Chaparro. Chessa Lutter and A. Virginia Camacho Hubner were the responsible technical officers and provided comments and technical oversight. An earlier draft was circulated at the Regional Technical Consultation for the Regional Action Plan on Neonatal Health, August 28-30, 2007. We would like to thank and acknowledge the following individuals for their valuable comments: Fernando Arango Gómez, Guillermo Carroli, Kathryn Dewey, José Luis Díaz Rossello, Joaquín Guillermo Gómez Dávila, Ornella Lincetto, Matthews Mathai, Judith Mercer, Hedwig van Asten and Patrick van Rheen. We would also like to recognize Yehuda Benguigui and Ricardo Fescina for their support in the development of this document.

This publication has been made possible thanks to support from the Regional Office of Sustainable Development, Office for Latin America and the Caribbean, United States Agency for International Development, under the terms of Grant No. LAC-G-00-04-00002-00. The ideas and opinions expressed do not necessarily reflect the point of view of the United States Agency for International Development, USAID.

For more information, please contact:

Unit on Child and Adolescent Health
Pan American Health Organization
525 23rd Street, NW, Washington D.C. 20037
Website: <http://www.paho.org> • Telephone: (202) 974-3519



**Pan American
Health
Organization**
Regional Office of the
World Health Organization



USAID
FROM THE AMERICAN PEOPLE