

Optimal Umbilical Cord Clamping

Position

The International Childbirth Education Association recognizes that the first minutes after birth are crucial to both mother and newborn. Best care practices for the mother-baby dyad should include the following: optimal umbilical cord clamping, skin-to-skin contact and unlimited access to breastfeeding. ICEA agrees with the World Health Organization (WHO, 2014) that the optimal time to clamp the umbilical cord for all infants regardless of gestation age or fetal weight is when the circulation of the cord has ceased and the cord is pulseless. This practice is often called delayed cord clamping (DCC).

As the newborn infant begins the physiologic adjustment to the environment, at birth, modern Western obstetrics may choose to implement procedures known as active management of the third stage: cord traction, early cord clamping, Apgar scoring and more. Early cord clamping (ECC) is described as cutting the umbilical cord immediately after birth, often before it has stopped pulsating.

While the time it takes for the umbilical cord to stop pulsating varies with every baby (from 1-3 minutes), the average time is approximately 3 minutes (ACOG, 2017).

Delayed cord clamping (DCC) is a practice by which the umbilical cord is not clamped or cut until after it stops pulsating. It may also include not clamping or cutting the umbilical cord until after the placenta is delivered. Many studies do not include the actual timing of the DCC, however it can range from 30 seconds to 180 seconds. Some say there are insufficient data to determine whether there is any additional benefit of waiting beyond 60 seconds (Rabe, 2019); Raju, 2013).

The World Health Organization (WHO) states; “Delaying cord clamping allows blood flow between the placenta and neonate to continue, which may improve iron status in the infant for up to six months after birth. This may be particularly relevant for infants living in low-resource settings with reduced access to iron-rich foods.” (WHO, 2014).

Benefits of Delaying Cord Clamping

Immediately after the birth of the baby, the cord pulsates and the placenta continues providing oxygen, red blood cells, stem cells, immune cells and blood volume to the baby. This transfer of blood is called *placental transfusion* and is an important part of the birthing process. Placental transfusion is facilitated by delayed cord clamping and can ensure safe oxygen levels and blood volume for the baby (Hutchon, 2012).

Several studies have shown benefits of delayed cord clamping (ACOG, 2017). Waiting to clamp the umbilical cord for a minimum of two minutes in full-term neonates following birth is beneficial to the newborn in the following respects: improved hematocrit (the volume by percentage of red blood cells in the blood); improved iron status as measured by ferritin (a protein that stores iron) concentration and stored iron; a reduction in the risk of newborn anemia and need for transfusion (McDonald, 2013). An increased risk of polycythemia (more red blood cells in the blood) when the cord is clamped later is notable; however, polycythemia may be beneficial in that more red blood cells are available to transport more oxygen to the tissues. The benefits of increased oxygenation seem to negate the negligible risks associated with polycythemia in healthy babies (McDonald, 2013).

A 2012 Cochrane Review of early cord clamping versus delayed cord clamping or cord milking for preterm babies found that a delay of 180 seconds provided babies with additional blood through delayed cord clamping or milking the cord before clamping appeared to help the babies to adjust to their new surroundings with fewer transfusions for

anemia, and the risks of intraventricular hemorrhage (IVH) and the risk of necrotizing enterocolitis were reduced (Rabe, 2012).

Factors Influencing Timing of Cord Clamping

The optimal timing of umbilical cord clamping has been the subject of a large number of studies, randomized controlled trials and meta-analyses. In most births, delay of cord clamping can take place if all involved in the birthing process agree. Delayed cord clamping would be contraindicated in cases where the newborn has respiratory distress and is in need of immediate resuscitation (ACOG, 2017).

McDonald et al reviewed the effect of timing of umbilical cord clamping of term infants on mother-baby outcomes. A review of 15 randomized trials involving a total of 3911 women and infant pairs showed no significant difference in postpartum hemorrhage rates when early and late cord clamping (generally between one and three minutes) were compared. From this study, some important advantages of DCC were shown to include higher birthweight, better early hemoglobin concentration and increased iron reserves up to six months after birth (McDonald, 2013).

Speculation exists on the relationship between DCC and cord blood banking. According to several leading cord blood collection banks, DCC and cord blood banking are not mutually exclusive. Since the placenta and umbilical cord can contain up to 200

ml of blood (which contains the hematopoietic stem cells as well as the iron reserves), current industry benchmarks for cord blood collections are a minimum of 50 ml, leaving approximately 150 ml to pulse into the newborn.

Delayed Cord Clamping and Premature Infants

Infants weighing < 1500 g with DCC tended to have higher mean BP, and needed less mechanical ventilation and surfactant compared with ICC neonates. Infants with DCC did not experience more polycythemia (Hct > 60%), but had a trend toward higher bilirubin levels with no differences in the phototherapy needs. DCC seems to be safe and may be beneficial when compared with ICC in premature neonates (Kugelman, 2007).

Rabe concluded in 2012 that DCC for 30-120 seconds in the premature infant less than 37 weeks' gestation appears to be better than clamping within 30 seconds, as it is associated with a reduction in the risk of IVH and less need for blood transfusion (Rabe, 2012).

Adverse Maternal or Neonatal Outcomes of DCC

Studies of DCC have found no significant differences in any maternal outcomes. With the exception of a slight increase in the need to treat hyperbilirubinemia, no differences have been found in babies in terms of neonatal outcomes such as

morbidity, mortality, Apgar scoring or NICU admission.

Implications for Practice

Sufficient evidence exists to support delayed cord clamping for all babies. ACOG, while concerned that delayed cord clamping could interfere with resuscitation efforts in preterm births, finds that the evidence does support DCC for preterm infants (ACOG, 2017). The World Health Organization states that DCC would require training of providers in the detection of symptoms of respiratory distress or other neonatal complications requiring immediate care. Many health benefits including less need for blood transfusion for anemia and reduction in IVH exist. The World Health Organization (WHO) recommends timing of cord clamping to 1-3 minutes after birth, with exception for those babies requiring immediate resuscitation (WHO, 2014).

Based on this data and the delay by providers to embrace new practice, parents wishing to delay cord clamping may need to state this as an option on a birthing plan. They may also have to request this desire in writing as their refusal to consent to early/ immediate cord clamping.

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