



Delayed Umbilical Cord Clamping:

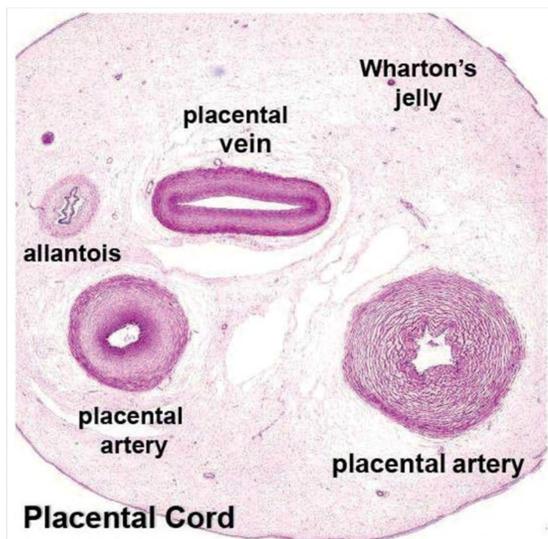
Effects on Extrauterine Transition in Full-Term Infants

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Abstract

The umbilical cord provides life-sustaining blood flow between the growing fetus and its mother throughout the length of the pregnancy. Upon delivery, the cord continues to pump nutrient-rich blood to the fetus until impeded by clamping or natural occlusion. A literature review of articles published from 2011 to 2018 was conducted in order to determine the effects of delaying cord clamping on extrauterine transition in full-term infants. It was found that a delay can in fact provide the infant with vital stores of hemoglobin, increasing iron status and improving not only hematologic function, but cardiovascular stability, neurologic development, and whole-body system outcomes. The most common adverse effect of such a delay is jaundice. It is recommended that cord clamping be delayed between 60 and 90 seconds in the full-term, low-risk infant in order to maximize positive outcomes and support a healthy extrauterine transition.



Results

Overall, umbilical cord clamping should be delayed.

Possible benefits:

Hematologic: increased hemoglobin, hematocrit, and ferritin; improved iron status leading to decreased instances of anemia; and resulting decreased need for blood transfusions.
Cardiovascular: improved blood pressure due to increased blood volume, and increased overall cardiovascular stability with a more ample blood volume.
Neurologic: improved neurologic and cognitive functions, improved psychomotor development, and improved prosocial behavior, all likely due to improved iron status.
Whole-body: improved organ perfusion, improved glucose stability, and improved thermoregulation with greater blood volume; and higher levels of maternal antibodies and increased hematopoietic stem cells due to increased volume transfused.

Possible adverse effects:

Hyperbilirubinemia, resulting in jaundice and need for phototherapy
Hypervolemia and polycythemia, resulting in increased hematocrit and blood viscosity
Need for admission to the NICU

Method of delaying: Length in literature varies 80-150 seconds. Position of the infant is also important as the effect of gravity may work against the flow of blood if the infant is raised above the level of the placenta, as in the case of being placed on the mother's chest. Several of the studies mentioned lowering the infant below the level of the placenta for the full length of the delay, placing the infant as high as 10 to 25 cm below the perineum to as low as the length of the cord allows. Lowering the neonate in this way works with rather than against gravity, allowing blood to continue toward the infant up until the time of clamping. The placement of the infant must also be considered in conjunction with the use of uterotonic medications, as the uterus continues to contract past the delivery of the infant in order to deliver the placenta.

Conclusion

Delayed cord clamping consistently improves cardiovascular, neurologic, hematologic, and general whole-body outcomes for full-term infants. DCC has the potential to decrease instances of iron deficiency and improve brain development, while also promoting a healthy transition to extrauterine life. It can be used in conjunction with immediate skin-to-skin contact after birth, another imperative for healthy transition and bonding. As cord clamping represents a medical intervention, parent(s) have the right to be presented sufficient education on possible risks and benefits of both immediate and delayed clamping, and have the right to choose. *DCC should become a standard of practice among all pregnancies and deliveries in which its implementation does not impede life-saving medical interventions.*

Purpose & Significance

Purpose: to determine the best practice standard for timing of umbilical cord clamping and to ensure that the information can be put into practice in patient interaction with healthcare professionals

Significance: Orange City Area Health System (OCAHS), a rural hospital in northwest Iowa affiliated with Sanford Health, currently delays umbilical cord clamping greater than 60 seconds in all vaginal deliveries unless the infant needs immediate resuscitation. Engaging in thorough research regarding the potential positive and negative effects of delaying cord clamping in full-term births will allow this hospital to continue to practice at the highest possible standard of care and continue serve its populations with integrity.

A comprehensive literature review was conducted using articles from November 2011 to October 2018 from the CINAHL and PubMed databases.

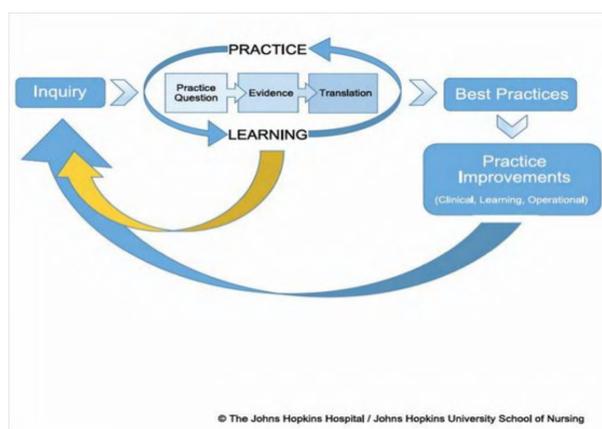
Keywords: umbilical cord clamping, placental transfusion, intact cord, full-term infant, full-term baby

Search results: 11 articles in CINAHL, 6 articles in PubMed

Exclusion: those articles that focused on preterm or premature infants, or very low birth weight babies

Methods

The Johns Hopkins Nursing Evidence-Based Practice Model appraisal tools were used to appraise the level and quality of evidence of the literature review.



PICO Question: In delivery of full-term neonates, how does delaying umbilical cord clamping compare to immediate cord clamping in improving infant transitions to extrauterine living?

Recommendations

Cord clamping should be delayed between **60 and 90 seconds** after delivery of the infant. While this delay is occurring, the infant will be positioned in one of two places depending on nature of delivery and birth plan preference:

- (1) If the parent(s) have elected not to implement immediate skin-to-skin contact in either a vaginal or cesarean delivery, the infant will be held at a minimum of 10 centimeters below the perineum to facilitate blood flow from the placenta to the infant.
- (2) If the parent(s) have elected to implement immediate skin-to-skin contact in either a vaginal or cesarean delivery, the infant will be placed on the mother's abdomen or chest and a uterotonic medication (such as Pitocin/oxytocin) should be administered to continue uterine contraction and facilitate blood flow from the placenta to the infant against gravity.

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