



Does the timing of umbilical cord clamping at delivery affect an infant’s long-term iron status?

Yes. This randomized, controlled trial from Sweden found that late clamping (≥ 180 seconds after delivery) led to improved iron status and a lower prevalence of iron deficiency at 4 months of age, compared with early clamping (≤ 10 seconds after delivery).

Andersson O, Hellström-Westas L, Andersson D, Domellöf M. Effect of delayed versus early umbilical cord clamping on neonatal outcomes and iron status at 4 months: a randomised controlled trial. *BMJ*. 2011;343:d7157. doi: 10.1136/bmj.d7157.

► EXPERT COMMENTARY

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Andersson and colleagues begin their published report by explaining the importance of adequate iron status to child development, particularly neurodevelopment. As they note, “Young children are at particular risk of iron deficiency because of high iron requirements during rapid growth in combination with low iron intake.” The investigators also point out that the prevalence of iron-deficiency anemia (3%–7%) and iron deficiency (as high as 26%) among young children in Europe, where this study was conducted, has troubling implications. Iron-deficiency anemia, in particular, may produce enduring cognitive and behavioral deficits.

This is the first randomized, controlled trial to explore the timing of umbilical cord clamping in a high-income country. Earlier studies in low- and middle-income populations have found that delayed cord clamping leads to an increased serum level of ferritin at 3 to 6 months of age.^{1–5}

The rationale for late clamping

Delayed clamping allows for placental transfusion of almost one third of the infant’s blood volume. Infants need the iron in all their red blood cells (RBCs)—circulating systemically and in the placenta—to guard against iron deficiency in the first few months of life. This need is unrelated to the mother’s health, iron status, and socioeconomic station.

Without the full quota of RBCs, an infant’s iron stores—reflected most accurately by ferritin levels at 4 to 6 months of age—will be suboptimal. Early clamping deprives newborns of RBCs remaining in the placenta and the iron they contain, which is essential for the development of the hematopoietic and central nervous systems.

The standard routine of administering oxytocin with early cord clamping, followed by controlled cord traction, was introduced

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Delayed clamping produces a 45% increase in iron stores that is measurable at 4 months of age

WHAT THIS EVIDENCE MEANS FOR PRACTICE

Delaying umbilical cord clamping for 3 minutes after delivery allows for substantial transfusion of blood from the placenta to the newborn. This extra blood protects the child from iron deficiency, producing a 45% increase in iron stores that is measurable at 4 months of age. The iron is required for optimal hematopoietic and central nervous system function. The benefits of delayed clamping are evident in both low- and high-income countries.

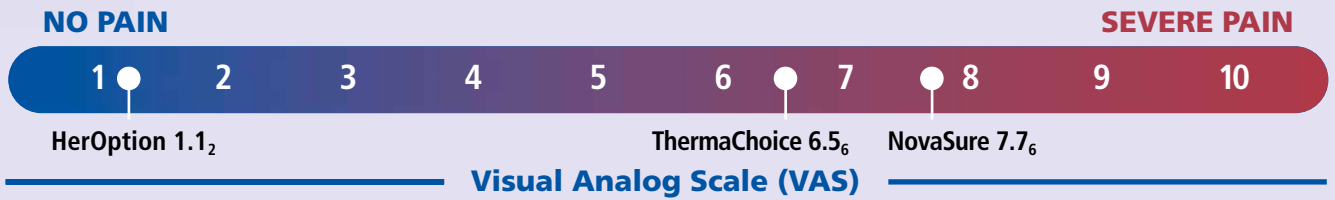
Delayed clamping is not associated with adverse effects in a healthy term newborn or the mother. It should become standard practice for term infants from uncomplicated pregnancies.

»ATHOL P. KENT, MBChB, MPhil, AND DAVID L. WOODS, MBChB, MD, DCH

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Examining the EVIDENCE



as part of the active management of the third stage of labor. Until recently, there were no randomized, controlled trials demonstrating how early clamping disadvantaged the infant.

Details of the trial

The trial was conducted in a Swedish county hospital in an affluent, high-income population. Four hundred full-term, singleton infants, born after low-risk pregnancy, were randomized to early or late cord clamping.

Intravenous oxytocin (10 IU) was given immediately after the cord was clamped. The time from full delivery of the baby to the start of cord clamping was measured by an assistant to the midwife.

Blood samples were taken from the newborns 48 to 72 hours after delivery and again at 4 months of age.

A clear benefit from delayed clamping

The infants' hemoglobin concentration and packed RBC volume were higher 2 days after delivery in the delayed-clamping group, compared with early clamping, and this translated into improved iron stores at the 4-month follow-up. Specifically, the rate of anemia at a median age of 2.4 days was 1.2% in the delayed-clamping group versus 6.3% for early clamping ($P = .02$; relative risk reduction 0.80; 95% confidence interval [CI], 0.22–0.95). And the geometric mean serum ferritin concentration at 4 months of age was 45% higher in the delayed-clamping group (117 $\mu\text{g/L}$

vs 81 $\mu\text{g/L}$; $P < .001$; 95% CI, 23%–71%). Iron deficiency was significantly more prevalent in the early-clamping group, but the prevalence of anemia was similar between groups. To prevent one case of iron deficiency—with or without anemia—the number needed to treat was 20 (95% CI, 17–67).

Other growth parameters were similar. Additional long-term tracking is planned.

One of the arguments against delayed clamping is that the practice raises the risks of respiratory symptoms, polycythemia, and hyperbilirubinemia, and increases the need for phototherapy. However, this study demonstrated that late clamping does not increase these risks.

The advantages and risks of delayed cord clamping in infants who are either preterm, growth-restricted, or hypoxic remain to be determined. 🚫

References

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FAST TRACK

To prevent one case of iron deficiency—with or without anemia—the number needed to treat (with late clamping of the cord) was 20

ON THE WEB

Dr. Woods spells out the fine points of delayed cord clamping, at obgmanagement.com