“Delay is as hateful as it is dangerous.”

“Defer no time, delays have dangerous ends.”

“Delay leads impotent and snail-paced beggary.”
“The cord must be clamped immediately. Otherwise, the baby’s blood will drain into the placenta.
Don't
JUST DO IT.
COMMITTEE OPINION

Number 684, January 2017

(Replaces Committee Opinion Number 542, April 2007)

Committee on Obstetric Practice

The American Academy of Pediatrics and the American College of Nurse-Midwives endorse this document. The Committee Opinion was developed by the American College of Obstetricians and Gynecologists’ Committee on Obstetric Practice in collaboration with committee members Maria A. Mascola, MD; T. Flint Porter, MD; and Tamara Tin-May Chang, MD.

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.
Why would you delay clamping?

• “More natural”

• Increase neonatal blood volume/iron stores
Why would you delay clamping?

- “More natural”
- Increase neonatal blood volume/iron stores
What health benefits are associated with increased neonatal blood volume/iron stores?
What health benefits are associated with increased neonatal blood volume/iron stores?

<table>
<thead>
<tr>
<th>Risks versus benefits in preterm neonates</th>
<th>Benefit</th>
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</thead>
<tbody>
<tr>
<td>Risk</td>
<td></td>
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<tr>
<td>Higher peak bilirubin concentrations (mean difference 15.01 mmol/L, 95% CI 5.62-24.4) but no statistically significant difference in need for phototherapy</td>
<td>Decreased need for transfusion (RR 0.61, 95% CI 0.46-0.81)</td>
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<td>Lower incidence of IVH, all grades (RR 0.59, 95% CI 0.41-0.85)</td>
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<td>Lower incidence of NEC (RR 0.62, 95% CI 0.43-0.90)</td>
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<table>
<thead>
<tr>
<th>Risks versus benefits in term neonates</th>
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<tbody>
<tr>
<td>Risk</td>
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<tr>
<td>More likely to require phototherapy (4.36% vs 2.74%, RR 0.62 for early clamping, 95% CI 0.41-0.96), although no statistically significant difference in peak bilirubin</td>
<td>Higher mean birth weight (~100 g, 95% CI 45-145)</td>
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<tr>
<td></td>
<td>Higher Hb in first day of life (~2 g/dL, 95% CI 0.28-4.06)</td>
</tr>
</tbody>
</table>
What health benefits are associated with increased neonatal blood volume/iron?

• There MAY be an additional benefit for child neurodevelopment
  • Childhood iron deficiency associated with impaired cognitive, motor, and behavioral development that may be irreversible
What health benefits are associated with increased neonatal blood volume/iron stores?

- One RCT of delayed clamping at term found statistically significant differences on test performance at 5 years age
  - Clinically meaningful?
Under what circumstances does delayed clamping lead to increased neonatal blood volume/iron stores?

- 30-60 second delay in clamping allows ~100 mL of blood flow from placenta to baby
- Gravity doesn’t matter
  - Fetal inspiratory effort is the primary driver of flow from placenta to neonate
- Cord pulsations don’t matter
  - Doppler studies show that palpable pulsations do not correlate with flow of blood from placenta to neonate
Are there maternal risks associated with delayed cord clamping?

No significant increase in estimated blood loss, hemoglobin following delivery, or need for transfusion (even at cesarean!)
Recommendations

The American College of Obstetricians and Gynecologists’ Committee on Obstetric Practice makes the following recommendations regarding the timing of umbilical cord clamping after birth:

- In term infants, delayed umbilical cord clamping increases hemoglobin levels at birth and improves iron stores in the first several months of life, which may have a favorable effect on developmental outcomes.
- Delayed umbilical cord clamping is associated with significant neonatal benefits in preterm infants, including improved transitional circulation, better establishment of red blood cell volume, decreased need for blood transfusions, and a lower incidence of necrotizing enterocolitis and intraventricular hemorrhage.
- Given the benefits to most newborns and concordant with other professional organizations, the American College of Obstetricians and Gynecologists now recommends a delay in umbilical cord clamping in vigorous term infants for at least 30-60 seconds after birth.
- There is a small increase in the incidence of jaundice that requires phototherapy in term infants undergoing delayed umbilical cord clamping. Consequently, obstetrician–gynecologists and other obstetric care providers must ensure that mechanisms are in place to monitor and treat jaundice.
- Delayed umbilical cord clamping does not increase the risk of postpartum hemorrhage.
Is it safe/feasible to delay cord clamping in neonates requiring resuscitation?

- Preterm gestational age
  - Is there any harm associated with delaying transfer to NICU for a 24 week neonate?

- Congenital anomalies
  - Do the benefits of delayed cord clamping outweigh the potential risk associated with delaying intubation of a newborn with a congenital diaphragmatic hernia?

- Neonatal depression
  - If neonatal respiratory effort is the primary driver of blood flow, will an apneic newborn benefit from delayed clamping?
Is it safe to push blood through the cord to facilitate placental transfusion without delaying resuscitation?

- “Milking” the cord
- Hemodynamic effects
- Vulnerable small vessels in certain neonatal populations (e.g., periviable)
PREMOD: umbilical cord milking is safe and effective for preterm infants born by cesarean.

Umbilical Cord Milking Versus Delayed Cord Clamping in Preterm Infants

Anup C. Katheria, MD, Giang Truong, MD, Larry Cousins, MD, Bryan Oshiro, MD, Neil N. Finer, MD

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>Neonatal Outcomes for Infants Delivered by CD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCM, N = 75</td>
</tr>
<tr>
<td>Birth Hb, g/dL*</td>
<td>16.3 ± 2.4</td>
</tr>
<tr>
<td>Polycythemia (hematocrit &gt;65%)</td>
<td>2</td>
</tr>
<tr>
<td>Urine output first 24 h, mL/kg per h*</td>
<td>4.42 ± 1.3</td>
</tr>
<tr>
<td>Need for transfusion</td>
<td>31</td>
</tr>
<tr>
<td>Peak bilirubin, mg/dL</td>
<td>8.1 ± 2.9</td>
</tr>
<tr>
<td>Necrotizing enterocolitis</td>
<td>1</td>
</tr>
<tr>
<td>Retinopathy necessitating surgery</td>
<td>1</td>
</tr>
<tr>
<td>Spontaneous intestinal perforation</td>
<td>3</td>
</tr>
<tr>
<td>Oxygen at 36 wk corrected</td>
<td>16</td>
</tr>
<tr>
<td>Any IVH</td>
<td>5</td>
</tr>
<tr>
<td>Severe IVH (≥grade 3)²</td>
<td>3</td>
</tr>
<tr>
<td>Retinopathy necessitating surgery</td>
<td>3</td>
</tr>
</tbody>
</table>
Impact of umbilical cord milking policy implementation on neonatal outcomes at the University of Utah

Research

Obstetrics

Effect of umbilical cord milking on morbidity and survival in extremely low gestational age neonates

Shrena Patel, MD; Erin A. S. Clark, MD; Christina E. Rodriguez, MD; Torri D. Metz, MD;
Reduction (%) in death and major morbidities associated with cord milking.
Delayed Cord Clamping Protocol

Deliveries <35 weeks OR planned NICU admission (e.g. congenital anomalies)

Cord milking prior to clamping and passing to NICU

Deliveries ≥35 weeks

Delayed clamping for 60 seconds, as long as infant is vigorous
- Strong cry
- Good tone
- Heart rate >100 bpm

Newborns 35w0d-36w6d will go to the warmer for assessment following cord clamping

Newborns ≥37w0d can remain skin-to-skin following cord clamping as long as they remain vigorous

- Management will be the same for vaginal deliveries and cesareans.
- Determination of vigor will be made by delivering OB provider, L&D nurse, and NICU nurse. If any of these nurses disagree, refer to refer to the infant's heart rate, Apgar scores, and the infant's overall condition.
Umbilical cord milking tied to severe IVH in very premature neonates

Delayed cord clamping and cutting is safer

**Publish date:** February 17, 2019

By Michele G. Sullivan

Wherefore art thou peer review?
Note that sIVH = 13% of all for DCM but 82% of all for UCM
Are there any contraindications to delayed cord clamping?

- Disruption of the fetoplacental circuit
  - Abruption
  - Fetomaternal hemorrhage
  - Cord avulsion
Summary

• Delayed cord clamping offers clear benefit for babies born preterm

• Cord milking at periviable gestational ages is controversial based on presented findings from a not-yet-published RCT.

• There are benefits of delayed cord clamping at term, but they are less clinically meaningful than preterm.

• Standardized policies re: delayed cord clamping may improve outcomes at institutions struggling to implement the practice.
References

10. McDonald SJ, Middle...