

# Delayed cord clamping

Lauren Theilen, MD, MSCI

November 1<sup>st</sup>, 2019

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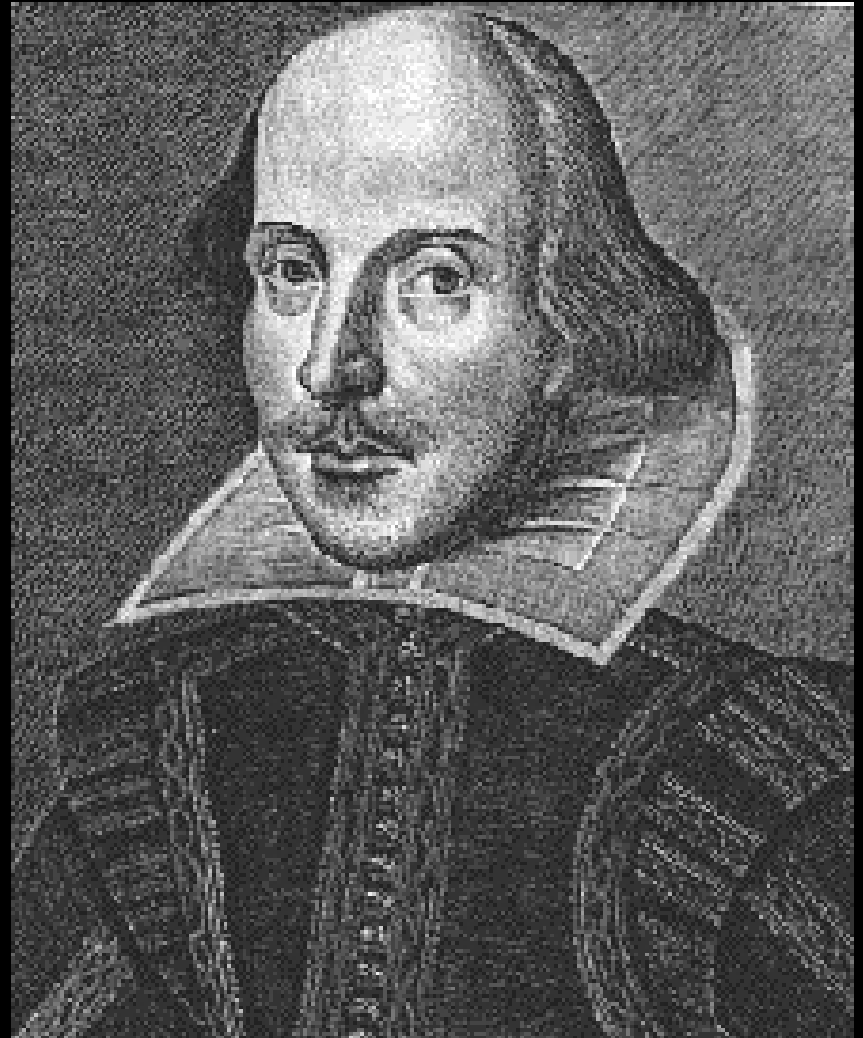


**HEALTH**  
UNIVERSITY OF UTAH

“Delay is as hateful  
as it is dangerous.”

“Defer no time,  
delays have  
dangerous ends.”

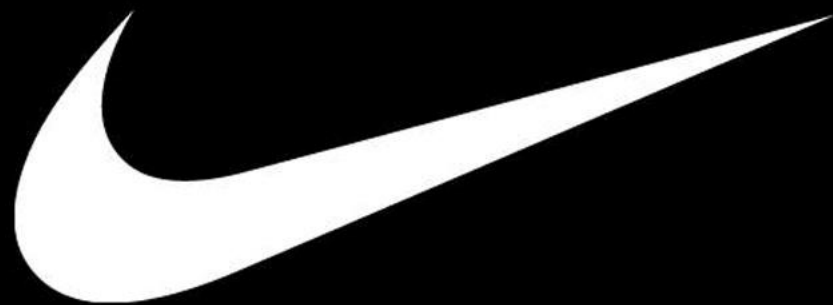
“Delay leads  
impotent and snail-  
paced beggary.”



“The cord must  
be clamped  
immediately.  
Otherwise, the  
baby’s blood will  
drain into the  
placenta.



Don't  
**JUST DO IT.**





The American College of  
Obstetricians and Gynecologists  
WOMEN'S HEALTH CARE PHYSICIANS

# COMMITTEE OPINION

Number 684, January 2017

*(Replaces Committee Opinion Number 541)*

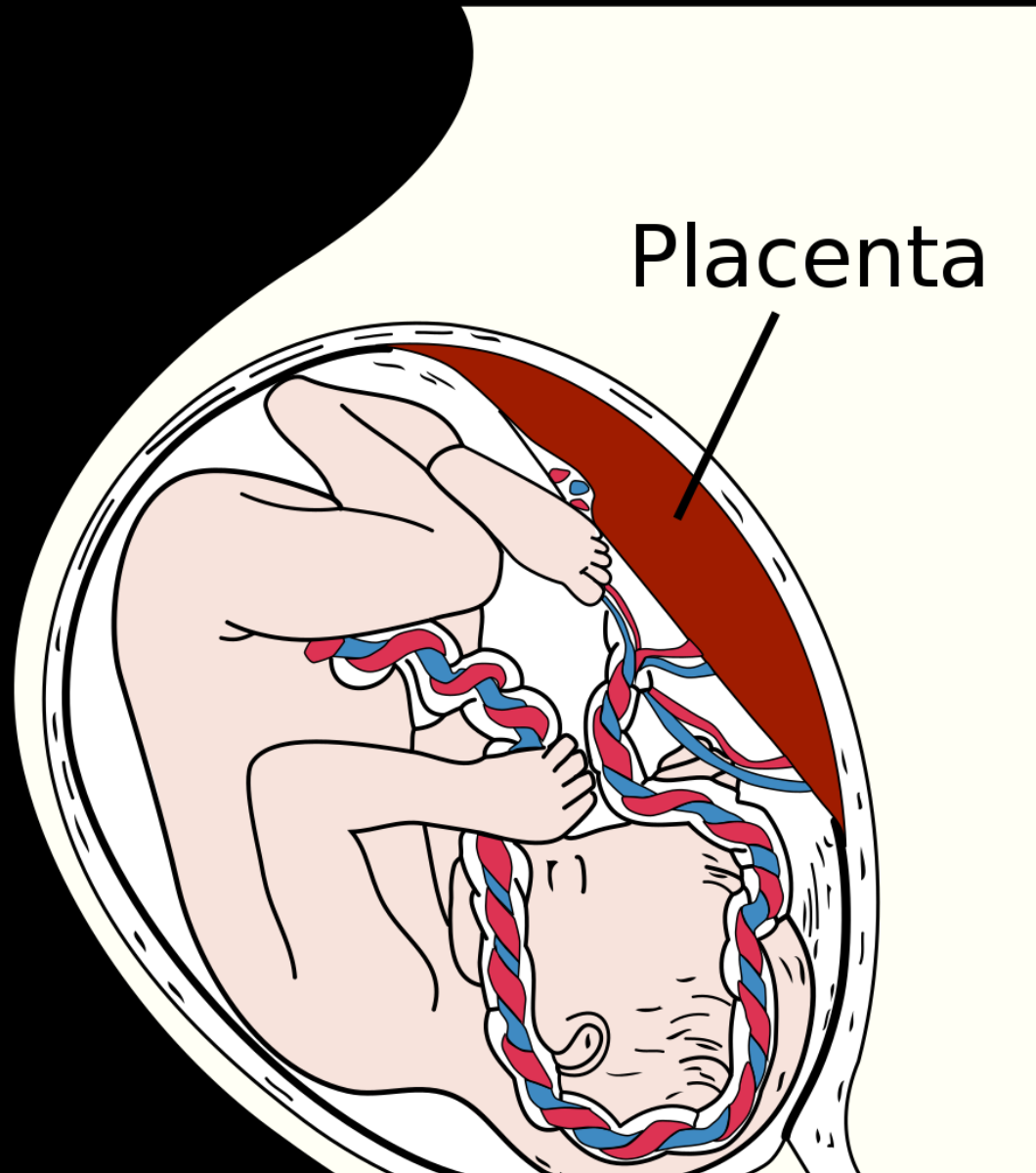
Committee on Obstetric Practice

*The American Academy of Pediatrics and the American College of Nurse-Midwives endorse this document. This 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 Chan, MD.*

*This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. This information should not be construed as dictating an exclusive course of treatment or procedure to be followed.*

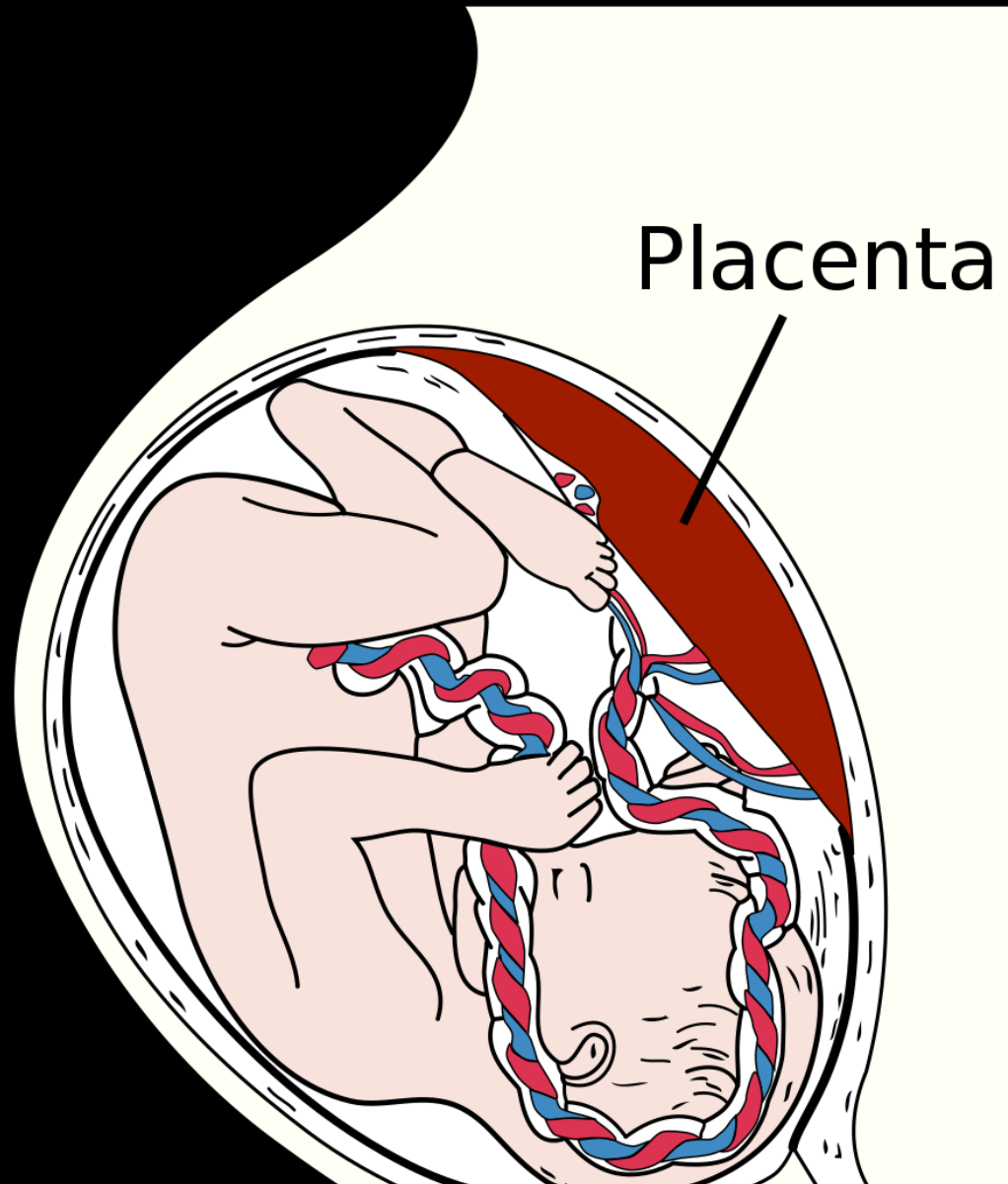
# Why would you delay clamping?

- “More natural”
- Increase neonatal blood volume/iron stores



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What health benefits are associated with increased neonatal blood volume/iron





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## Risks versus benefits in preterm neonates

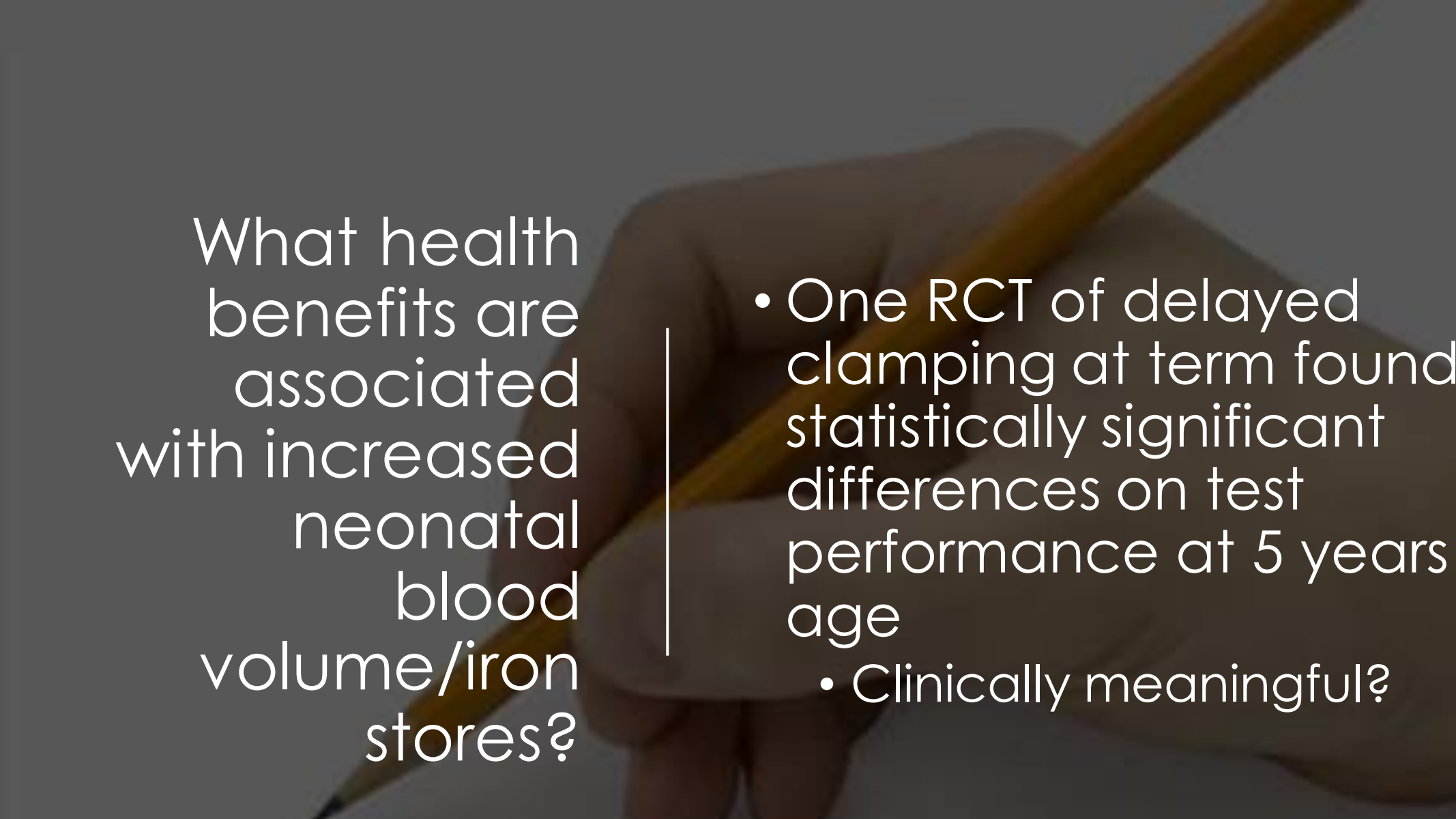
Risk	Benefit
Higher peak bilirubin concentrations (mean difference 15.01 mmol/L, 95% CI 5.62-24.4) but no statistically significant difference in need for phototherapy	Decreased need for transfusion (RR 0.61, 95% CI 0.46-0.81)
	Lower incidence of IVH, all grades (RR 0.59, 95% CI 0.41-0.85)
	Lower incidence of NEC (RR 0.62, 95% CI 0.43-0.90)

## Risks versus benefits in term neonates

Risk	Benefit
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	Higher mean birth weight (~100 g, 95% CI 45-145)
	Higher Hb in first day of life (~2 g/dL, 95% CI 0.28-4.06)

# 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 to 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 during 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 transfusion, decreased 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 under delayed umbilical cord clamping. Consequently, obstetrician-gynecologists and other obstetric care providers recommending umbilical cord clamping in term infants should ensure that mechanisms are in place to monitor and treat neonatal jaundice.
- Delayed umbilical cord clamping does not increase the risk of postpartum hemorrhage.

# Is it safe/feasible to delay cord clamp in neonates requiring resuscitation?

- Preterm gestational age
  - Is there any harm associated with delaying transfer to NICU 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 asphyctic 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. preterm)



# 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<sup>a</sup>, Giang Truong, MD<sup>b</sup>, Larry Cousins, MD<sup>c</sup>, Bryan Oshiro, MD<sup>d</sup>, Neil N. Finer, MD<sup>a</sup>

**TABLE 3** Neonatal Outcomes for Infants Delivered by CD

	UCM, N = 75	DCC, N = 79
Birth Hb, g/dL*	16.3 ± 2.4	15.6 ± 2.2
Polycythemia (hematocrit >65%)	2	4
Urine output first 24 h, mL/kg per h*	4.42 ± 1.3	3.99 ± 1.2
Need for transfusion	31	41
Peak bilirubin, mg/dL	8.1 ± 2.9	7.3 ± 2.2
Necrotizing enterocolitis	1	0
Retinopathy necessitating surgery	1	2
Spontaneous intestinal perforation	3	2
Oxygen at 36 wk corrected	16	12
Any IVH	5	10
Severe IVH (≥grade 3) <sup>a</sup>	3	3
Survival (>36 weeks corrected)	5	7

# Impact of umbilical cord milking policy implementation on neonatal outcomes at the University of Utah

## RESEARCH

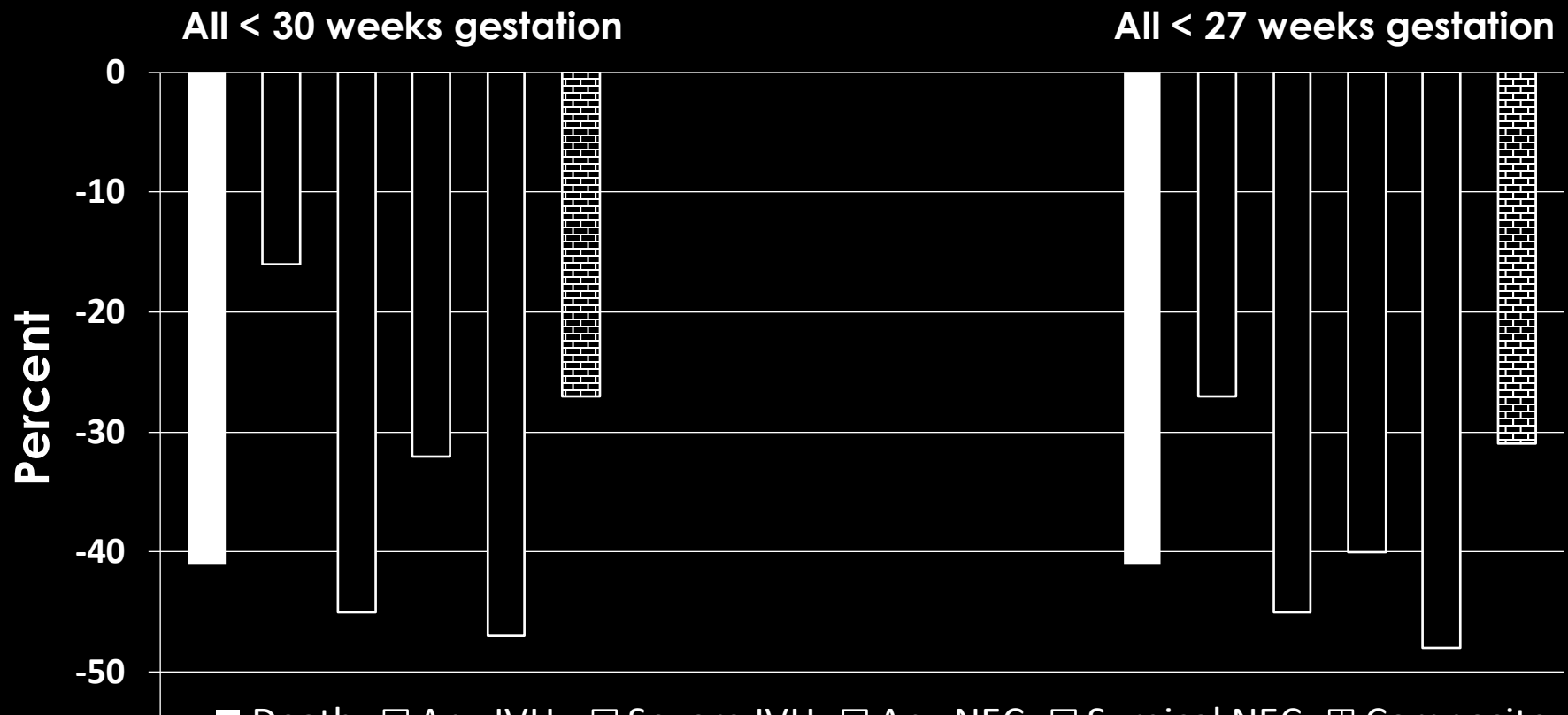
ajc

### OBSTETRICS

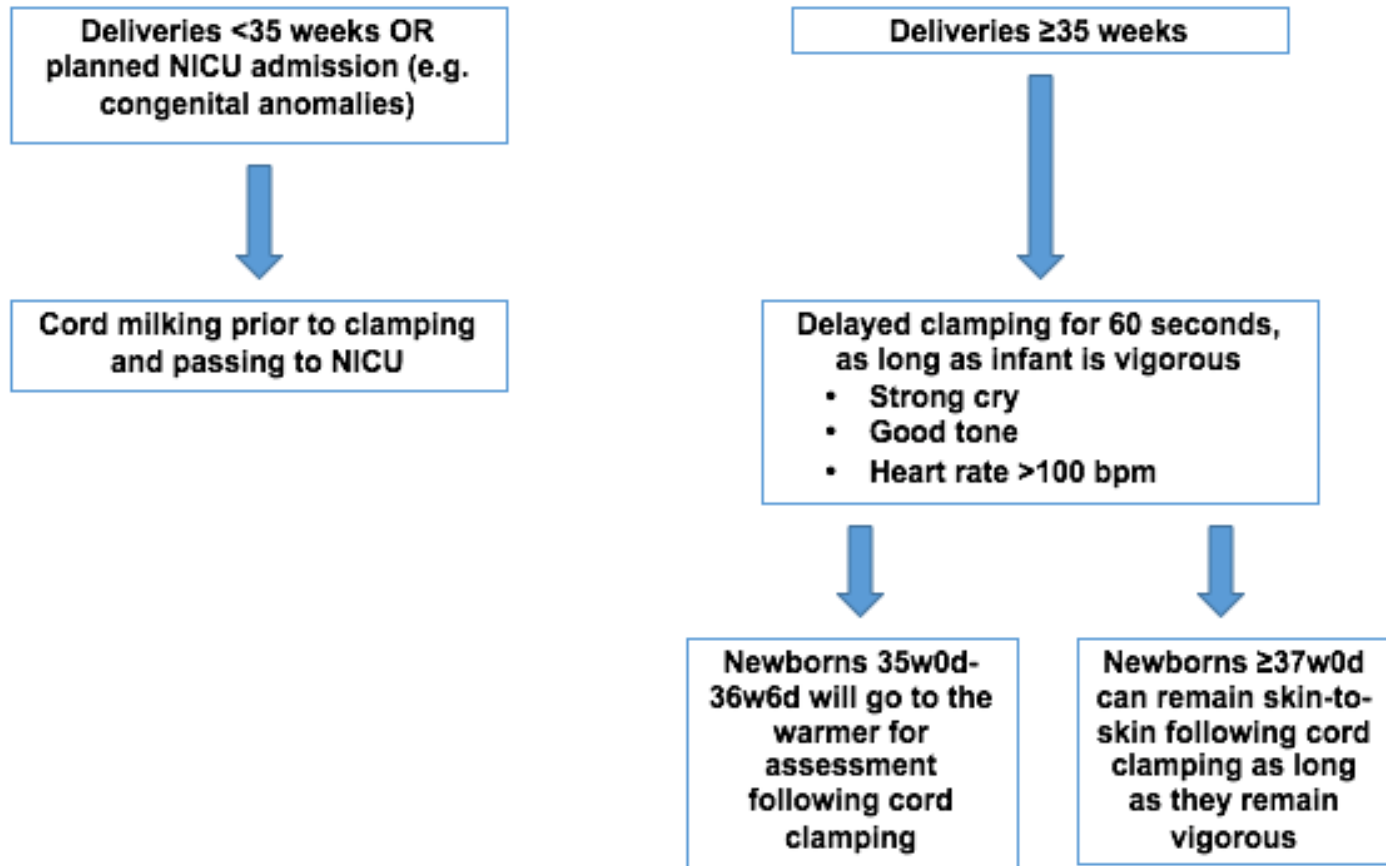
## **Effect of umbilical cord milking on morbidity and survival in extremely low gestational age neonates**

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 milk



## Delayed Cord Clamping Protocol



- 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

# Umbilical cord milking tied to severe IVH in very premature neonates

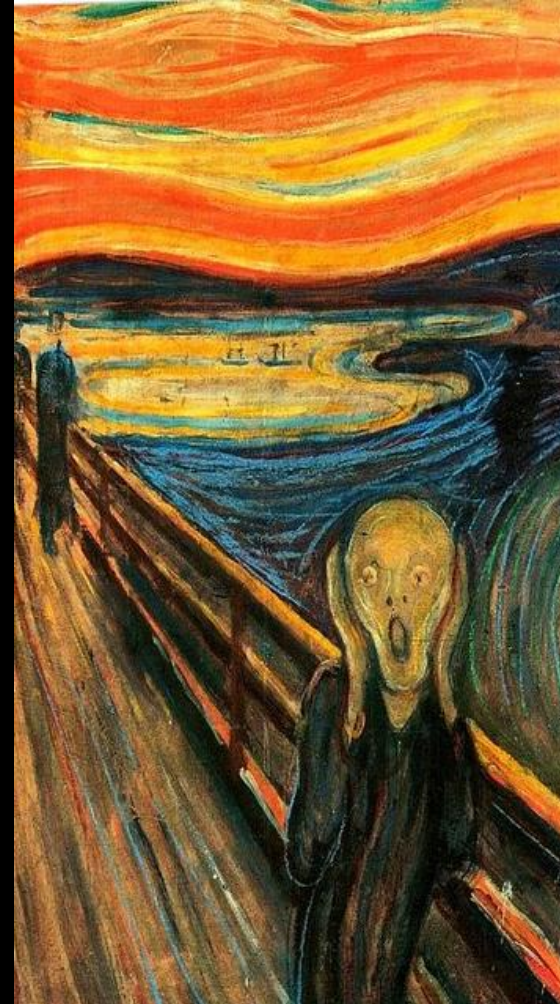
Delayed cord clamping and cutting is safer

**Publish date:** February 17, 2019

By [Michele G. Sullivan](#)

Ob.Gyn. News.

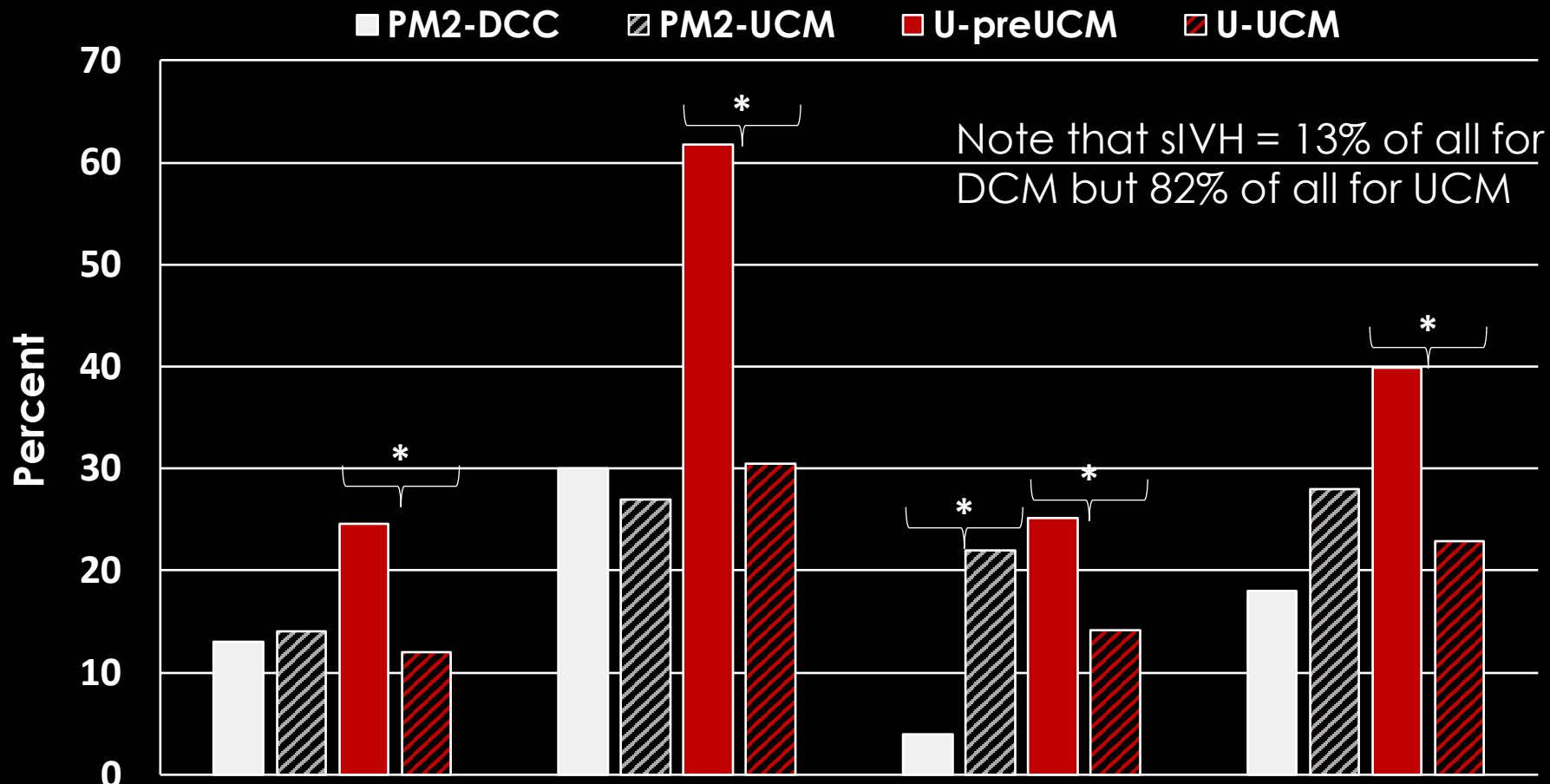
REPORTING FROM THE PREGNANCY MEETING





Wherefore art thou  
peer review?

# OUTCOMES - PREMOD2 vs U of U





# Are there any contraindications to delayed cord clamping?

- Disruption of the fetoplacental circuit
  - Abruptio
  - 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 study
- 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

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