

2022 UCD Delayed Cord Clamping (DCC) Protocol

Background:

Delayed cord clamping in both term and preterm infants is recommended by many national and international organizations. It is now standard of care in many countries including the United States. Numerous high-quality studies have demonstrated improved neonatal outcomes after delayed cord clamping with minimal risks to the neonate or mother.

Neonates have approximately 100-120 mL/kg of blood in circulation. It is estimated that 80 mL of blood is passed from the placenta to the newborn in the first minute after delivery. The physiologic transfusion of blood from the placenta to the newborn is associated with decreased mortality rates, increased hemoglobin and iron levels, better developmental outcomes, and decreases the incidence of blood transfusions. Umbilical cord milking has been performed in the past but is not currently recommended due to increased risk intraventricular hemorrhage in preterm infants.

See benefits section below for summary table from a 2018 meta-analysis by Fogarty et al including 18 randomized control trials delayed vs early clamping in 2,834 infants less than 37 wk.

Outcomes for infants <37 wk	Relative risk /Mean difference; 95% Confidence interval	Inclusion Studies	Participants
Hospital mortality	0.68; 0.52-0.90	18	2,534
IVH (all grades)	0.87; 0.75-1.00	19	2,871
IVH (severe IVH)	0.87; 0.59-1.27	11	2,300
NEC	0.88; 0.65-1.18	12	2,397
Cardiorespiratory support at resuscitation	0.89; 0.71-1.17	10	748
Exchange transfusion	0.29; 0.05-1.73	7	2,139
Severe retinopathy of prematurity	0.72; 0.47-1.09	2	839

Partial exchange transfusion	0.14; 0.01-2.74	4	1,743
Polycythemia (Hct >65%)	2.65; 1.61-4.37	13	2,529
Peak Hematocrit (%)	MD 2.73; 1.94-3.52	2	1,587
Peak bilirubin (umol/L)	MD 4.43; 1.15-7.71	15	2,358

Inclusion:

Agreed to be eligible by OB and NICU/Pediatrics teams prior to delivery

No known exclusions prior to birth

Contraindications/Considerations:

Maternal	Fetal	Placental
- Medically unstable - Uterine rupture - Uncontrolled DM	- RBC alloimmunization - Monochorionic twins - Urgent resuscitation - Hydrops	- Abnormal Placentation: *Placenta accreta *Placenta previa *Vasa previa - Abruptio - Surgical disruption - Cord avulsion - True Knot
*General Anesthesia: Discuss benefit vs. risk with Ob/NICU		*Reverse End Diastolic Flow: Discuss benefit vs. risk with Ob/NICU

Vaginal Delivery Procedure:

1. OB/NICU "huddle" just prior to delivery to confirm plan for DCC
2. OB Nurse will obtain pre-warmed blankets for OB team
 - If infant is ≤ 29 weeks, a sterile Polyurethane bag will also be used
3. Once infant is delivered and DCC begins, NICU team watches clock and states out loud "15 seconds.... 30 seconds.... 60 seconds"
4. OB Team will:
 - a. Gently dry and stimulate infant in warm blankets at the level of the perineum or on the mother skin to skin
 - b. Suction mouth and nose with bulb syringe
5. Timing of Delay:
 - a. For preterm infants <37 weeks--- After a total of 60 seconds, NICU (if present) or Nursery RN will say "60 seconds complete" and OB team will clamp cord and hand infant to NICU/Nursery RN

- If infant is ≤ 29 weeks, a sterile Polyurethane bag will be used
- b. For infants >37 weeks--- typically 60 seconds (up to 3 minutes) depending on infant status and need for evaluation or resuscitation. After 60 seconds Primary RN will say "60 seconds complete" and OB team will clamp cord and hand in Nursery Nurse.

***** NICU and/or OB may decide to abort DCC at any point depending on neonate or maternal clinical status*****

6. Infant NPR resuscitation continues with NICU and Nursery teams
7. OB Team to document in chart that DCC was completed

Cesarean Delivery Procedure:

1. OB final scope just prior to delivery to confirm plan for DCC
2. NICU Nurse will obtain sterile pre-warmed blankets

*If ≤ 29 weeks:

Place activated chemical warmer into sterile polyurethane bag to be place on sterile field, lengthwise on mother's upper thighs at time of delivery. Prepare a second polyurethane bag to place infant into once delivered.

Place infant into bag, keeping face exposed. NICU MD/Fellow/NNP will monitor condition of infant to determine length of DCC. Once cord cut, leave chemical warmer in place and only transfer infant in polyurethane bag to resuscitation bed.

3. Once infant is delivered and DCC begins, NICU team will step up to OR table and NICU team watches clock and states out loud "15 seconds.... 30 seconds.... 60 seconds"
4. OB Team will:
 - a. Gently dry and stimulate infant at the level of the abdomen/chest. Ok to show infant to family for 10-20 seconds.
 - b. Suction mouth and nose with bulb syringe
5. Timing of Delay:
 - a. For term and preterm infants -- After a total of 60 seconds, NICU RN will say "60 seconds complete" and OB team will clamp and cut cord and hand infant to NICU team

***** NICU and/or OB may decide to abort DCC at any point depending on neonate or maternal clinical status*****

6. Infant resuscitation continues with NICU team
7. OB Team to document in chart that DCC was complete

Questions?

-For NICU questions or concerns contact: Christina Muffy Sollinger, MD

-For OB/MFM questions or concerns contact: Anna Curtin, MD

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