Optimal Cord Clamping
by Mary Esther Malloy

There are many things that help our children to be as healthy as possible during their first minutes, hours, days, months and years. If the findings of new research are correct, then ensuring that our babies get their full volume of blood as they are born might be one of the more important steps we can take for the well-being of our children.

Here is the problem: while studies are showing us that there appears to be no good justification for the routine clamping and cutting of a baby’s umbilical cord seconds after the baby is born, survey after survey shows that most obstetricians and many midwives are still clamping and cutting cords very soon after delivery as a matter of course, with some rates as high as 95% (Downey and Bewley 2012; van Rheenen 2011). Dr. Jose Tolosa and colleagues write, “Although without clear benefit and no rationale to support it, early cord clamping remains the most common practice among obstetricians and midwives in the western hemisphere” (Tolosa et al. 2010).

What can we do about the disparity between evidence that strongly supports delayed cord clamping and widespread habits of practice that we know are not beneficial for our children? We can educate ourselves. We can share research with our doctors and midwives. We can advocate for a change in business as usual.

Don’t Leave Your Child Behind in the 20th Century
Another thing very injurious to the child, is the tying and cutting of the navel-string too soon; which should always be left till the child has not only repeatedly breathed, but till all pulsation in the cord ceases. As otherwise the child is much weaker than it ought to be; a part of the blood being left in the placenta, which ought to have been in the child.

—Erasmus Darwin, 1796, a respected physician, philosopher, botanist and the grandfather of Charles Darwin (Chaparro 2011)

As Grandfather Darwin’s comments illustrate, we have a record of debate over the timing of when to clamp and cut the “navel string” that dates back centuries. For the most part, however, the cross-cultural norm appears to have been to wait until the placenta is delivered and frequently hours after the placenta emerges, to “tie off” the cord (Downey and Bewley 2012). In the early-to-mid-1900s, however, a new norm began to appear. Physicians argued for and widely disseminated the practice of cutting the cord soon after a baby was born. Over the 20th century, immediate cord clamping joined the triumvirate of practices making up what we now refer to as the active management of third stage labor: early cord clamping, a uterotonic drug such as Pitocin and controlled cord traction (for a research-based critique of the active management of third stage labor, see Goer and Romano 2011, pages 377–410). Decades later and following a near-universal adoption of immediate cord clamping, we are left with an absence of solid evidence that this intervention confers a benefit to our babies and more and more evidence of harm (van Rheenen 2011). It is time to move beyond this practice.

Why?

Very simply, when a baby is still inside her mother, fetal circulation demands a continual flow of blood between the baby and the placenta. It is at the site of the placenta where de-oxygenated blood is re-oxygenated and where nutrients are picked up for the baby as waste is offloaded. At the time of birth, approximately two-thirds of the baby’s blood is in the baby’s body and about one-third of the baby’s blood is circulating in the cord and placenta. If the cord is clamped and cut immediately following the birth, the blood still circulating in the cord and placenta is lost to the baby. The result is a newborn starting life on the outside lacking a significant percentage of her blood volume.

If the cord is left alone in the minutes following birth, this rich blood is pumped by way of the cord into the baby, a process referred to as the placental transfusion. A 2011 study by Farrar et al. measures the quantity and duration of the placental transfusion. The study concludes that for most babies, the blood flow from placenta to baby was completed between 2 and 5 minutes with the blood volume averaging 30% (24–40%) of the baby’s total blood volume (Farrar et al. 2011). We would consider any adult down 30% of his or her normal blood volume to be in a state of extreme distress. Somehow, we have normalized this situation for our newest babies.

Why does it matter when we cut the cord?
Oxygen
Allowing the placental transfusion has immediate, as well as longer term, benefits for your child. One of the most time-sensitive and critical jobs a newborn must accomplish is to make the switch from gas/cord oxygenation to lung breathing. An understanding of newborn transitional physiology is emerging that stresses the importance of the blood volume and increased red cell supply provided by the placental transfusion to the start of lung breathing (Mercer 2002; see also Goer and Romano 2012, page 403). Furthermore, while this transition to lung breathing is underway, the oxygen-rich blood flowing to the baby provides a potentially helpful secondary source of oxygen for the baby during the delicate process of switchover (van Rheenen 2011).

Iron
“Anaemia is now a recognized complication of early cord clamping” (Downey and Blewly 2012).

Researchers are now connecting the dots between the global public health problem of anaemia in young children worldwide and the practice of early cord clamping. The authors of a recent, well-designed study found that delayed cord clamping significantly improves iron status and reduces anaemia and iron deficiency to four months of age (Andersson et al. 2011). Others have followed the benefits of improved iron stores to six and seven months (Chapparro 2006; Mercer 2010).

Interestingly, this timeframe tracks with the general period recommended for exclusive breastfeeding. And, curiously, as perfect a food as breastmilk is, it does not supply iron to our babies. Could it be that nature has designed it such that a few minutes of blood transfusing at the time of birth ensures the necessary iron for the baby’s development for the first half-year? It would appear so. Unfortunately, this means that if cords are clamped according to current practices, our breastfed babies are at the highest risk for iron deficiency.

Iron deficiency, the primary cause of anaemia, is of concern because it can negatively impact a child’s cognitive and motor development (Andersson 2011). With a quarter of the world’s population experiencing anaemia, a simple shift in practices at the time of birth may potentially help our next generation, especially those who are exclusively breastfed for their first months, to start life on the outside with iron levels that support optimal brain development (Greene 2012).

Stem Cells
This is no ordinary blood we are discussing. It is chock full of stem cells, those immature, self-renewing cells that can turn into a variety of tissues. The authors of a recent study published in the Journal of Cellular and Molecular Medicine suggest delaying cord clamping in order to realize “man-kind’s first stem cell transfer”:

Nature’s first stem cell transplant occurs at birth when the placenta and umbilical cord start contracting and pumping blood toward the newborn…. This phenomenon occurs in most placental mammals and this transfusion of blood is allowed to end physiologically in most species except in human beings. Hu-
man beings manipulate the transition from foetal to neonatal life by early clamping of the umbilical cord, meaning that nature’s first stem cell transplant is curtailed, thus depriving infants of additional stem cells (Tolosa et al. 2010).

The above excerpt describes the essential role stem cells play in the development and maturity of many organ systems including the central nervous, respiratory, cardiovascular, hematologic, immunologic and endocrine systems. The authors again write: “…the artificial loss of stem cells at birth could potentially impact later development and predispose infants to diseases such as chronic lung disease, asthma, diabetes, epilepsy, cerebral palsy, Parkinson’s disease, infection and neoplasm” (Tolosa et al. 2010).

Thus, a simple delay in cord clamping may permit an inborn stem cell therapy that can “promote acute benefits in the case of neonatal disease, as well as long-term benefits against age-related diseases” (Tolosa et al. 2010). It is possible that the greatest health benefit to a newborn when we delay clamping the cord may come from the increased volume of stem cells whose value we are only starting to understand.

Aside from a healthier baby, there are benefits for the mother as well. Allowing the placental blood to drain has been shown to help the placenta detach in a timely and uncomplicated manner (Soltani, Dickin-son and Symonds 2005; Jongkolsiri and Manotaya 2009).

It makes no sense that this valuable secondary source of oxygen for your baby’s first minutes, important iron for your child’s first months and miraculous stem cells whose impact may last a lifetime end up in the medical waste bin. This good blood belongs to your baby. Make sure your child receives it.

What Is Optimal Cord Clamping?
Optimal cord clamping simply means waiting to clamp and cut the cord until it has finished its job. After the cord has pumped the appropriate quantity of blood from the engorged placenta into the baby, it will no longer pulse. If you touch and feel the cord soon after your baby is born and then touch it again once it has finished pumping, you will notice a significant difference. The cord will go from full and curly-cue-ish with a noticeable pulse and purple-blue tones to flaccid and white, absent a pulse once it has finished.

The easiest approach is to ask your provider to wait until the placenta is born before the cord is cut. This way, you know for certain that the placenta and cord have completed their work. If this is beyond the imagination or belief system of your provider, ask your provider to wait a mere 90 seconds following your child’s birth to clamp the cord. Even 90 seconds will make a difference (Greene 2012). Or, how about just 30 seconds? There is evidence that the job can be completed in just 30 seconds if the child is placed below the mother in the range of 40cm following the birth (Yao and Lind 1969).

“Just don’t do something, sit there!” For providers used to clamping cords immediately, you are asking them to do nothing when they are used to doing something. Standing by and doing less can be quite challenging for many. As a doula, I have found that meaningful conversations (prior to the start of labor, of course) and sharing resources can help care providers put aside familiar habits and offer a willingness to try something new. During labor, as the moment of birth nears, birth partners might want to clearly remind care providers to delay clamping. Again, you may be asking a medical professional to do something outside her training and rituals of practice. A reminder will help.

Part of the challenge here is structural. If a baby is born in a hospital and requires suctioning or help with startup, the furniture is arranged such that the cord needs to be cut just so the baby can be taken to a table for attention. And yet, the benefits of receiving oxygen via the cord blood, especially for that small percentage of babies who require resuscitation, may be critical (van Rhenen 2011). Can a table be placed next to the mother’s bed? Can the work happen on the same bed in which the baby is born? This is what happens at a hospital birth. We have to ask our hospital-based care providers to do things differently to keep our babies close by, even when extra attention is needed—especially when extra attention is needed! Talk about what is possible in your hospital. Invite your provider to think outside the box. Given all that we humans have accomplished, this cannot be beyond our capabilities.

**Cesarean Birth**

In trials investigating the impact of delayed cord clamping, cesarean births are very much included. In most cases, the protocol they follow is simply to place the baby on the mother’s lap for a determined period of time while the placenta transfills (Andersson et al. 2011; Yao and Lind 1969; Farrar et al. 2011). The “natural cesarean” being pioneered in parts of the UK emphasizes family bonding and babies are placed directly on their mothers’ chests for immediate skin-to-skin contact (Smith, Plaat and Fisk 2008). While the doctors describe immediate cord cutting as part of their protocol, their pioneering work offers a model where it would be a simple adjustment to leave the cord intact should they be so inclined. If a cesarean birth is the best and safest way for your baby to be born, ask your doctor what the team can do to help your child have some amount of time following the birth for the placental transfusion to occur.

**Claim the Golden Minutes of Your Child’s Birth: Pause**

“Desire to place infant immediately on mother skin-to-skin (is) given as reason to clamp cord” (Chapparro 2011).

There is one more idea to include here, which may require you to think outside your set of expectations. While it is lovely to receive your baby directly to your chest at the moment of birth, this is not the only way to meet a child. Two of my babies were delivered to my chest while my third was guided down where she was born. For me, the key difference with my third was that I was able to really see her in the moments she arrived. As she rested below me, she and I paused, unhurried through this moment, and I had the space to touch, explore and welcome her with every fiber of my being. It was an extraordinary gift to meet my daughter in this way (Malloy 2011).

**Feeling My Daughter’s Cord Pulse**

I mention my experience meeting my third child for the following reason. As my just-born daughter lay below me, getting started on lung breathing and extra-uterine life in all its complexity, she was simultaneously
receiving her placental transfusion in what would appear to be a particularly efficient way. There is evidence that gravity can help (or hinder) the placental transfusion. Yao and Lind found that the rate and volume of placental blood transfer is indeed affected by gravity. They state that the transfusion was largely unaffected when babies were held approximately 10 cm above or below the mother’s introitus. However, hydrostatic pressure either hastened or impeded the transfusion when a baby was placed in the range of 20 cm or more above or below the mother, with the most obvious impact in the 50+ cm range (Yao and Lind 1969).

This is a question that deserves more research, for sure. However, from an evolutionary point of view, this just might make sense. If the pre-historical record of birth is anything to go by, and we can assume that upright birth played a significant role in the evolution of human birth, then there is a high probability that many a woman (and primate ancestor) throughout human (and pre-human) time has birthed a baby down onto a surface below, taken a much-needed moment to recover, and then inspected and gathered up her child. In the seconds or minutes during which the newborn rested below the mother, the placental transfusion would have been aided by gravity as the placenta worked quickly to return the baby’s full blood volume to the baby. This landing and resting below the mother, cord and placenta hard at work, is certainly what happens with most, if not all, mammals (Hirata et al. 2011; Tolosa et al. 2010).

Why not ask your provider to simply guide your baby down where he is born and give you a minute or two to touch, talk to and welcome your child as he lies below or before you? Gravity will be working to aid the placental transfusion, helping your child to a healthy start. Consider claiming those minutes of delaying the cord clamping as some of the fullest of your life. These are the sacred moments in which you are first meeting your child on the outside. Pause. Breathe. Study. Discover. Listen. Welcome.

Put down the phones and cameras along with the clamps and scissors. Take this time to begin absorbing what you have just done and welcome this new person, all the while ensuring your child receives his full blood volume at birth.

**Health Care by Participation**

No matter where babies are placed as they are born, there is little question that US obstetricians and midwives will change current practices from immediate cord clamping to optimal cord clamping; it is just a question of when. I fully anticipate that within a decade, immediate cord clamping will no longer be a routine component of the management of third stage labor regardless of whether the baby is premature, full-term, born vaginally or by cesarean. The evidence against this practice is too strong. Dr. Alan Greene is more optimistic and wants an end to immediate cord clamping as a routine by 2014. He is calling for public health by participation (drgreene.com). Please participate by asking your midwife or doctor to practice optimal cord clamping for your child and by sharing some of this information with your health care provider and your social network.

**References**


Jongkolsiri, J, and Lind found that the rate and volume of placental blood transfer is indeed affected by gravity. They state that the transfusion was largely unaffected when babies were held approximately 10 cm above or below the mother’s introitus. However, hydrostatic pressure either hastened or impeded the transfusion when a baby was placed in the range of 20 cm or more above or below the mother, with the most obvious impact in the 50+ cm range (Yao and Lind 1969).

This is a question that deserves more research, for sure. However, from an evolutionary point of view, this just might make sense. If the pre-historical record of birth is anything to go by, and we can assume that upright birth played a significant role in the evolution of human birth, then there is a high probability that many a woman (and primate ancestor) throughout human (and pre-human) time has birthed a baby down onto a surface below, taken a much-needed moment to recover, and then inspected and gathered up her child. In the seconds or minutes during which the newborn rested below the mother, the placental transfusion would have been aided by gravity as the placenta worked quickly to return the baby’s full blood volume to the baby. This landing and resting below the mother, cord and placenta hard at work, is certainly what happens with most, if not all, mammals (Hirata et al. 2011; Tolosa et al. 2010).

Why not ask your provider to simply guide your baby down where he is born and give you a minute or two to touch, talk to and welcome your child as he lies below or before you? Gravity will be working to aid the placental transfusion, helping your child to a healthy start. Consider claiming those minutes of delaying the cord clamping as some of the fullest of your life. These are the sacred moments in which you are first meeting your child on the outside. Pause. Breathe. Study. Discover. Listen. Welcome.

Put down the phones and cameras along with the clamps and scissors. Take this time to begin absorbing what you have just done and welcome this new person, all the while ensuring your child receives his full blood volume at birth.

**Health Care by Participation**

No matter where babies are placed as they are born, there is little question that US obstetricians and midwives will change current practices from immediate cord clamping to optimal cord clamping; it is just a question of when. I fully anticipate that within a decade, immediate cord clamping will no longer be a routine component of the management of third stage labor regardless of whether the baby is premature, full-term, born vaginally or by cesarean. The evidence against this practice is too strong. Dr. Alan Greene is more optimistic and wants an end to immediate cord clamping as a routine by 2014. He is calling for public health by participation (drgreene.com). Please participate by asking your midwife or doctor to practice optimal cord clamping for your child and by sharing some of this information with your health care provider and your social network.

**References**


**Sources:**


Mary Esther Malloy is a New York City-based doula, birth counselor and Bradley childbirth educator who has the pleasure of parenting three children ages 2, 9 and 11. Henci Goer and Amy Romano’s unflagging efforts to make the evidence available inspired her to write this article. For more about Mary Esther, please visit mindfulbirthny.com.