

Cord Clamping

Discussion Group

Topic: Delayed cord clamping

Question:

A first time mom went to the doctor and went through her birth preferences. He told her he was on board except she needed to take in to consideration something. When you give the baby to the mom with cord still attached all the nutrients flow away from the baby and if you hold the baby too low then all the blood and nutrients RUSH toward the baby. It scared her of course. I calmed her and tried to be diplomatic and explained he is only doing what he was taught in med school. Has anyone heard anything about this?

Responses:

1. Sarah Buckley's new book, "Gentle Birth, Gentle Mothering" has a great explanation of what really happens. Great book overall. Highly recommend it... 'blood transfusion and risks of early clamping' starts on page 189. (You must go to her website to order the book-- www.sarahjbuckley.com)

2. Not so. I've just been pouring into all of the three-inch medical books that I have and then some. What I'm reading is something like this--I'm not quoting. Repeatedly, I have read that the blood from the mother and the baby's blood don't mix. This business of the baby losing this or that or having too much of this or that is a fallacy. The blood from the two is separated by a thin membrane. The mother's blood with the oxygen and nutrients goes into a space between the baby's capillaries in the placenta called villi. It is then passed on to the baby through diffusion. It is not a direct flow. It stands to reason that the perfected reproductive system would not allow for blood to flow back and forth. Babies would all end up with anemia if it flowed back out of them. Why do doctors think that the cord stops pulsing at just the right time for the baby. When a sufficient amount has been passed, the cord stops pulsing, and the baby's own breathing and circulatory system begin to take over. The cord is no longer needed. This assures that the baby will have a sufficient amount of oxygen should his own system not readily take over. Perhaps someone with a long standing knowledge of these things could explain it better than I or correct anything that I've not expressed correctly.

Then there's the lotus birth, where baby, cord and placenta and all are allowed to stay joined for many, many hours--at least 24. At the just the right time, the cord begins to shrivel.

One doctor a few years ago told a mom that once the baby is born, the blood that flows back into the mother becomes a foreign agent within her body; and it could poison her and vice versa with the baby--that's why they have to clamp it immediately to prevent the toxicity in both mother and baby.

Babies can and DO lose 20 to 50 percent of their blood volume during immediate cord clamp... but it stays within the cord/placenta mechanism, not flowing back into the mother. They DO frequently become anemic at some point during their first year or years from this practice. Read the article on Physiology of the Cord Clamp on the left side of the web page.

You know, if you were to have a terrible accident on the way home from work or something, and present by transport in the ER with loss of 50 percent of your adult blood volume, the place would be active as an ant mound trying to put you back together. Yet we do this to newborns every day out of total medical ignorance. As I said before, it's a testament to the human will to live and that

*indomitable human spirit that babies survive *in spite of* what we do to them, rather than *because* of it.*

Please go to www.cordclamp.com for marvelous information on this vital subject.

Topic: Cord Blood Collection WITH Delayed Cord Clamping

We did this for our daughter. You can wait till the cord has stopped pulsing and once it has immediately cut it and harvest. We talked about this with our OB and he was anxious to cut it before it stopped pulsating, but we convinced him that we would forego getting the best sample and risk not getting a great sample to have the cord finish pulsating. So he did that and we got both – a good sample and a cord that completely pulsated. So net net, it can be done. OBs will be anxious about it, and they have to be willing to risk that they may not get a great sample. (FYI – We used Viacord. I am not sure if it makes a difference in the collection process, but they do have different kits, so maybe theirs was more conducive to this)

You need to harvest right away. They need 40 cc's (about 2 ounces) I have done this (or tried to) several times at home births, and never get enough as the Mom's want to wait a bit before clamping and cutting. You might suggest having your couple read Michel Odent's work about the chemistry and changing pressures in the womb and in the baby during this critical time right after birth. I'd recommend that all HypnoBirthing instructors read all of Odent's work. Some of his connections to birth are a bit far flung, but the undisturbed birth itself is the thing and he describes all we set in motion (for the detriment of us all) when we disturb birth and the valuable time afterwards.

Is it more important for your baby to get their own blood, or to withhold it in case they happen to get sick later down the road. Jan is a fabulous person to ask, as she is the resident cord expert. =)

As it happens, I wrote to Dr. Morley (www.cordclamp.com) as soon as I read the first post on this subject. Am now waiting to hear back from him.

It is my understanding that one can wait for pulsing to stop; then take the collection closer to the placental end of the cord.

In a choice between the two -- delayed cord clamp and cord blood collection -- there simply shouldn't BE any choice. To think that a healthy newborn would/could be deprived of up to 50 percent of his blood volume by ICC (immediate cord clamp) so that blood can be collected, for the remote possibility that he would contract a disease, for which some cure using stem cells could possibly be found, and the even slimmer possibility that his very own blood would actually be used for this purpose, is ludicrous to me. It's my understanding that the use of this cord blood is done by a bank that draws from it whatever it needs to, and that one is extremely unlikely to receive one's own cord blood for any process when the need arises. Statements from various medical organizations do NOT support cord blood collection in this way. The major ones benefiting from this newest interventive rage in birthing circles is the banks themselves.

To Clamp, or Not To Clamp, This Is the Answer

By G. M. Morley, MB ChB FACOG <<mailto:morley@cordclamping.com>>

<http://www.whale.to/a/morley7.html>

After reading many pages about cord clamping, most expectant parents will be confused about what to tell their doctor or midwife regarding cord clamping. The normal, healthy newborn with millions of years of experience in its genetic code, clamps its own cord, usually within two to four minutes of birth.

After natural closure, the doctor's cord clamp may be safely applied. How does one know that the child has clamped all of the three cord vessels?

1. There are no pulsations in the cord. (The arteries are closed.)
2. The child is breathing and is pink. (The heart is two sided; lungs are working.)
3. The cord vein at the umbilicus is bloodless. (It is the largest of the three vessels.)

At this stage, with all vessels closed, the rest of the cord vein is often divided into sausage like segments of blood, while the arteries are white streaks.

The color of the child is best determined by the color of the lips and tongue. If these are blue or purple, the cord should not be clamped; a bluish color indicates that the heart has not yet converted from the fetal to the adult circulation. If a child is crying and blue, blood is not flowing through the lungs and is not absorbing oxygen; even if the cord is no longer pulsating, it should not be clamped as more placental blood transfusion through the cord vein may be needed to fill the lungs' blood vessels. Uterine contraction or gravity will effect this.

All mammalian babies are naturally delivered downwards, and blood tends to run into the newborn from the placenta. Most human babies are delivered in bed, the best position being MacRoberts' with the knees held up near the chin. The child should not be placed on the mother's abdomen immediately, as this may cause blood to flow back into the placenta. Cord pulsations normally persist until the child is crying or breathing, and the child is in no danger of asphyxia while the cord is pulsating at over 100 beats per minute. Bulb suction clearing of the newborn's mouth and nose is done with the child still attached to the placenta between the mother's legs on the bed.

Everyone, of course, wants to hear that first cry that brings smiles to all the surrounding faces. Air in the lungs opens up the lung blood vessels. What makes babies cry when they are born?

Every child is born soaking wet, and on entering the planet's atmosphere, water evaporates and the skin cools, and babies yell ñ as they do when they have cold, wet diapers on their bottoms. Grown men, on entering a cold shower, take a very deep breath and start to sing opera; on entering the cold world, wet babies do the next best thing, reflexively. At baptism, cold holy water on the head produces crying from the child and smiles on the relatives' faces. A cold, wet sponge applied to a newborn will usually induce crying which fills the lungs with air and blood if the cord is open. An alcohol pad applied to the abdomen has the same effect. [1]

The politically correct method of resuscitation places the newborn in a warmer that simulates the inside of the uterus. This environment tells the child's reflexes not to breathe and cry, and not to convert the heart to two sides as oxygen is available from the placenta. The only problem with this situation is that the placenta is not in the incubator, it usually has been thrown away, and there is no placental oxygen to keep the brain alive. For millions of years, newborns' skins have cooled after birth. They have adapted to that problem very well by crying and yelling and making their mothers pick them up to keep them warm at the breast while the placental circulation has kept them warm and oxygenated in the interval. A newborn that is hypothermic

(has a low temperature) is usually in hypovolemic shock following immediate cord clamping and is in need of a blood transfusion.

Never clamp the pulsating cord of a child that is not breathing and pink; if the child is slow to cry, put a cold diaper on its bottom or an alcohol pad on its abdomen. This usually is more effective and more natural than rubbing with towels or spanking the feet.

At cesarean section, the problem of cord clamping is more complicated. Uterine contraction seldom delivers the child and seldom transfuses the child immediately. Gravity also seldom transfuses the child which, when delivered, is usually placed on the mother's abdomen above placental level; blood tends to flow back into the relaxed uterus. Landau kept the placenta and cord intact and hung up the placenta like an I.V. to give the child as much blood as it would accept. This produced very healthy newborns.[2] An alternative solution is to give pitocin I.V. during the cesarean delivery to contract the uterus so that blood is forced into the child soon after delivery. Having the uterus contracting or in labor before the cesarean is started helps the placental transfusion during and after delivery. The same parameters for cord clamping are then applied as for vaginal delivery. The cord may be safely clamped after:

1. There are no pulsations in the cord
2. The child is breathing and is pink
3. The cord vein at the umbilicus (the largest of the three vessels) is bloodless.

If there is any doubt about these conditions, it is usually safe to leave the cord alone until the placenta is delivered.

There are few exceptions to the above; in general, there should be no interference with a vigorously pulsating cord that is filled with blood. Lack of breathing, however, should not be treated with complacency. Uterine contractions will eventually separate the placenta from the uterus and placental oxygenation will then cease. This may occur in as little as five minutes, and if the child is not breathing or crying within one or two minutes of birth despite placental transfusion, stimulation, and drugs to counter narcotics, efforts to ventilate the lungs such as bag-masking or even intubation should be started.

Newborn Resuscitation

A very depressed baby may not respond to cold and stimulation, and artificial ventilation may be needed. It is extremely important that placental oxygenation and placental transfusion be maintained (the cord should NOT be clamped) during resuscitation. If heart tones disappear during delivery and the child has no heartbeat at birth, all available cord blood should be milked into the child; this may re-start the heart. If the heart rate is very slow at birth, the child should be lowered below the level of the placenta to allow gravity to fill the child with oxygenated blood from the placenta.

There are two rare situations when the cord should be clamped immediately:

1. Bleeding from a ruptured cord at birth.
2. Following a very "dry" birth when the cord and placenta contain little blood.

The first is usually very obvious and is quickly stopped by closing the bleeding cord between finger and thumb. All blood in the cord should be milked (stripped) into the child and the cord

clamped immediately. This same treatment is used at cesarean section for placenta previa when the placenta has to be incised to deliver the baby.

The second, following oligohydramnios (no fluid around the baby), results in a very dehydrated newborn in very poor condition, usually heavily meconium stained. In these cases, the cord is visibly quite empty, and the vessels may appear as three thin streaks of blood due to cord vessel narrowing. In both the above cases, placental transfusion is not available, and immediate clamping is needed for insertion of a catheter into the umbilical vein for immediate transfusion of fluids and blood volume expanders. A neonatologist who is familiar with what normally occurs with a child's cord and placenta immediately after normal birth is best qualified to handle these situations. Amnioinfusion (replacement of amniotic fluid) during labor may alleviate the second condition to a great extent before birth.

Neonatologists may demand immediate clamping for timely ventilation at the resuscitation table; however, timely presence of the neonatologist at the delivery or operating table is much more appropriate, especially with meconium contamination of the airway.

DeLee (long tube) suction to clear the mouth, esophagus and naso-pharynx is done before delivery of the shoulder. After birth, with placental respiration intact and with an assistant positioning the apneic child, the vocal cords are readily visualized without panicked haste; an umbilical cord pulse rate of over 100 indicates adequate oxygenation, and removal of carbon dioxide by the placenta delays the first inspiratory gasp and allows tracheal clearing of meconium. [3] When ventilation is established, the child with an adequate blood volume rapidly turns a ruddy pink color; placental oxygenation avoids any asphyxia.

Immediate clamping of the apneic newborn causes complete asphyxiation until the lungs function, and rapid build up of CO₂ hastens the first gasp that aspirates meconium. Without placental transfusion, adequate establishment of the pulmonary circulation may not occur; [4] without blood flow to absorb oxygen, ventilation is futile. Very low five minute Apgar scores and neurological deficits [5] result from immediate clamping and failed resuscitation. [6]

If any physician cannot believe that the child clamps its own cord very well, the following exercise should convince any doubting Thomas. After the above three parameters for cord closure are well established, and before placing the clamp on the cord, try to strip some blood from the cord next to the umbilicus into the child; it is very difficult to do so and the high pressure may rupture the cord vein. The child's clamp has effectively stopped the contracting uterus and gravity from giving the child too much blood. Now strip blood away from the umbilicus for about six to eight inches; that segment of vein will remain empty ñ no blood is flowing from the child. Cut the cord (without clamping) six inches from the umbilicus. The cord will not bleed. The child's clamp is keeping the right amount of blood in the child to make the lungs work. Even though the child's clamp has millions of years of experience and guarantees behind it, the doctor will feel more comfortable if he now puts a clamp on those three large blood vessels that are not bleeding. That clamp does no harm.

Natural cord closure is a complex event that prepares the child for a healthy start to life outside the womb; good obstetrical care should reserve and ensure natural cord closure; it should not disrupt the process. Three clinical criteria are enumerated above which indicate that the cord vessels are closed and that the lungs are functioning. A cord clamp may be safely applied after these criteria are in place.

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<mailto:morley@cordclamping.com>March 8, 2002

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Delaying Umbilical Cord Clamping Benefits Pre-term Infants (Newswise)

<http://www.newswise.com/articles/view/519578/?sc=rsmn>

A brief delay in clamping the umbilical cords of babies born before 32 weeks protects them from bleeding in the brain and infections, according to a new study by a University of Rhode Island professor of nursing. The results of the federally funded study by Judith Mercer, a clinical professor of nursing and certified nurse-midwife, were published in the latest issue of Pediatrics, the journal of the American Academy of Pediatrics.

Click here for the abstract

<http://pediatrics.aappublications.org/cgi/content/abstract/117/4/1235?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=umbilical+cords&searchid=1&FIRSTINDEX=0&volume=117&issue=4&resourcetype=HWCIT> ; Citation is PEDIATRICS Vol. 117 No. 4 April 20April 20, 2006 — Delayed cord clamping at birth reduces neonatal anemia, according to the results of a randomized trial reported in the April issue of *Pediatrics*.

"The umbilical cord is usually clamped immediately after birth," write José M. Ceriani Cernadas, MD, from the Hospital Italiano de Buenos Aires in Argentina, and colleagues. "There is no sound evidence to support this approach, which might deprive the newborn of some benefits such as an increase in iron storage.... Iron deficiency early in life may have pronounced central nervous system effects such as cognitive impairment; iron deficiency is also the main cause of anemia, one of the most serious conditions in childhood, especially in developing countries."

In 2 obstetrical units in Argentina, 276 neonates born at term without complications to mothers with uneventful pregnancies were randomized to cord clamping within the first 15 seconds (group 1), at 1 minute (group 2), or at 3 minutes (group 3) after birth.

At 6 hours after birth, mean venous hematocrit values were 53.5% in group 1, 57.0% in group 2, and 59.4% in group 3. Statistical analyses showed equivalent results among groups because the

hematocrit increase in neonates with late clamping was within the prespecified physiologic range.

The prevalence of anemia, defined as hematocrit less than 45%, was significantly lower in groups 2 and 3 than in group 1. The prevalence of hematocrit greater than 65% was similar in group 1 (4.4%) and in group 2 (5.9%) but significantly higher in group 3 (14.1%) than in group 1. Other neonatal outcomes and maternal postpartum hemorrhage were not significantly different in the 3 groups.

"Delayed cord clamping at birth increases neonatal mean venous hematocrit within a physiologic range," the authors write. "Furthermore, this intervention seems to reduce the rate of neonatal anemia. This practice has been shown to be safe and should be implemented to increase neonatal iron storage at birth."

The authors recommend controlled follow-up studies of the relationship between delayed cord clamping and the presence of anemia and iron status in infants.

"Another benefit of delayed clamping would be the increase of hematopoietic stem cells transfused to the newborn, which might play a role on different blood disorders and immune conditions," the authors conclude. "The advantages of umbilical cord clamping at least at 1 minute after birth could decrease the prevalence of iron-deficiency anemia in the first year of life, especially in populations with limited access to health care."

United Nations Children's Fund (UNICEF) Argentina supported this study. The authors have disclosed no financial relationships.

Pediatrics. 2006;117:e779-e786

Delayed Cord Clamping Benefits Pre-term Infants

http://www.ivanhoe.com/channels/p_channelstory.cfm?storyid=13535

Reported April 14, 2006

(Ivanhoe Newswire) -- Delaying umbilical cord clamping by just a few seconds could help prevent health problems in pre-term infants.

A new study shows the short wait in babies born before 32 weeks protects them from infections and from bleeding in the brain. Judith Mercer, a professor of nursing and certified nurse-midwife at the University of Rhode Island in Providence, conducted the federally funded trial.

"These findings are very important because in most U.S. hospitals umbilical cords are clamped immediately," says Mercer. "This is an easy, no-cost procedure that increases the amount of blood the baby receives at birth. This blood gives the baby more red blood cells to carry oxygen and has high concentrations of beneficial stem cells."

During the study, babies had their umbilical cords clamped either between 5 seconds and 10 seconds of birth or at 30 seconds to 45 seconds after birth. Mercer found infants in the delayed cord-clamping group had significantly lower rates of bleeding in the brain and blood infections, which occur more than 72 hours after birth and can cause developmental delays and conditions such as cerebral palsy.

The research found delayed cord clamping had the greatest effect on boys. Pre-term boys are most at risk of death and disability than any other children.

The loss of blood volume at birth and a compromised immune system caused by the loss of protective stem cells may be the reasons for brain hemorrhage and infections. Mercer explains, "We think babies with delayed clamping have increased blood flow from the cord which helps to stabilize the cardiovascular system and results in less bleeding in the brain."

Next, she hopes to study the effects of delayed cord clamping in full-term infants.

This article was reported by Ivanhoe.com, who offers Medical Alerts by e-mail every day of the week. To subscribe, go to: <http://www.ivanhoe.com/newsalert/>.

SOURCE: *Pediatrics*, 2006;117:1235-1242

Delayed cord clamping helps tiny babies

<http://medcompare.com/news.asp?newsid=129243&typeid=26>

NEW YORK (Reuters Health) - Waiting 30 to 45 seconds before clamping the umbilical cord of very low birth weight infants -- those weighing less than 1500 grams -- seems to protect them against bleeding in the brain and the development of blood infections later on, researchers report.

The strategy seems to benefit boys especially.

"While countries in Europe tend to wait before clamping these children's umbilical cord, the current practice in the United States is to clamp it immediately after delivery," Judith Mercer told Reuters Health. "There hasn't been a lot of research done in this country on delayed cord clamping, and most studies were limited by small samples."

Evidence is accumulating to suggest that, for very low birth weight infants, delaying cord clamping and lowering the newborn below the mother's level significantly increase the amount of blood flowing from the placenta to the newborn, according to Mercer, from the University of Rhode Island in Kingston.

In their article in the **Medical Journal Pediatrics**, she and her colleagues note that waiting 30 to 45 seconds results in an 8 percent to 24 percent increase in the baby's blood volume.

"Immediate cord clamping may deprive these infants of essential blood volume, which might result in hypotension (low blood pressure) and in a poor perfusion of the tissues," Mercer explained.

Her group's study involved 72 pregnant women who gave birth to infants before the 32nd week of gestation. The women underwent either immediate cord clamping at 5 to 10 seconds after the birth, or delayed cord clamping 30 to 45 seconds after delivery.

The researchers saw differences between the two groups in rates of brain bleeds in the babies, and in their risk of late-onset sepsis. These differences were significant from a statistical standpoint in male infants, but not in females. Specifically, 2 of the 23 male infants in the delayed-clamping group had intraventricular hemorrhage compared to 8 of the 19 in the immediate-clamping group. No case of sepsis occurred among the first group, whereas 6 cases occurred among the others.

The researchers say the strategy is a simple way to improve outcomes of very preterm infants.

Discussion Group

Topic: Jaundice with delayed cord clamping

There is a very slight (mostly theoretical) possibility of increased jaundice with delayed cord clamping. Medical people were on a tear about this back in the '80s, but research did not support the theory. It works like this: in utero, babies have a high number of red blood cells (their hematocrit hemoglobin is very high compared to mom's) because they need lots red blood cells to get every bit of oxygen they can from the placental blood. Once the baby is born and breathing air, it is a lot easier for them to get enough oxygen, so not as many red blood cells are needed and the baby begins to break them down.

The break-down products include bilirubin. Bilirubin has to be attached to an albumin molecule in the liver in order to be excreted easily from the body. Immature livers sometimes cannot do this efficiently, and the bilirubin builds up, creating jaundice (bilirubin deposits in the skin.) The skin, with the help of sunlight or artificial UV light, can break down the bilirubin too. Adequate feeding is necessary so that the baby can eliminate the bilirubin, but supplementation is rarely necessary—colostrum and breast milk are adequate if the baby is nursing well and often. After 48 hours of age, many babies get this "physiologic" or "normal" jaundice, which is not a concern.

So...if there is more blood going to the baby from delayed cord clamping, there are more blood cells for the baby to deal with. However, there has never been a study that strongly indicates that babies with delayed cord clamping have more jaundice.

And what's the big deal with jaundice??? That's overrated in full term babies, too. In premies or sick babies, the buildup of bilirubin can make deposits in the brain, causing brain damage. Term babies can handle much higher levels of bilirubin, and it is extremely unlikely that damage will occur when the jaundice is due to the natural breakdown of red blood cells as described above.

Other causes of jaundice include anything that causes increased breakdown of red blood cells (Rh or ABO blood group incompatibility with the mom, hereditary problems with red blood cells, etc.) or decreased liver function (rare.) High bilirubin/jaundice in the first day of life is a big red flag and is usually treated much more aggressively, as it should be.

As for "breast milk jaundice" that is also overrated. Very rarely a woman has a substance in breast milk that hinders the baby's ability to eliminate bilirubin. It does not cause a health problem for the baby, just makes him "yellow" for longer. Some doctors insist that the baby be taken off breast milk for 24 hours, but that is not supported by breastfeeding experts and research.

How bilirubin is excreted from the body:

Albumin is a protein found in the body--the same protein that is found in the urine in preeclampsia. It is used in many ways throughout the body.

Bilirubin is a very small molecule that is a breakdown product of the "extra" red blood cells and it goes into the gut for excretion. The molecule is small enough that it can be easily reabsorbed. As the bilirubin circulates through the blood stream to the liver, the liver "conjugates" it by attaching a molecule of albumin to each bilirubin molecule--thus making it too big to reabsorb. If the liver is immature, it takes longer for the bilirubin to all be conjugated and the bilirubin level builds up in the blood. From there it goes into the skin, eyes, and eventually the brain, where it can do damage.

If the level gets to a worrisome level, a test can be done to see if the majority of the bilirubin is unconjugated (indicating a healthy liver that just can't work fast enough to keep up) and if the level is high enough to warrant treatment, the baby is put under bilirubin lights (which can now be done at home.) There is also a "light blanket" that can be used. Sunlight for a short time each day is not enough if the level is really worrisome enough to need treatment.

A high level of conjugated bilirubin indicates that the liver is doing the work of attaching the albumin, but can't get the bilirubin moved into the gut for excretion. This is usually due to a malformation of the ducts in the liver, called "biliary atresia." Surgery can sometimes help, but a liver transplant is often needed for this condition.

Conjugated and unconjugated bilirubin is sometimes called "direct" and "indirect" bilirubin, and I can never remember which is which. (Dumb terms, if you ask me.)

Is that more than you ever cared to know? Feel free to use this to answer parents' questions. No need to attribute it to me--I only gleaned the info from great teachers.

The Effect of Timing of Cord Clamping on Neonatal Venous Hematocrit Values and Clinical Outcome at Term: A Randomized, Controlled Trial

<http://www.ncbi.nlm.nih.gov/pubmed/16567393>

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ABSTRACT

BACKGROUND. The umbilical cord is usually clamped immediately after birth. There is no sound evidence to support this approach, which might deprive the newborn of some benefits such as an increase in iron storage.

OBJECTIVES. We sought to determine the effect of timing of cord clamping on neonatal venous hematocrit and clinical outcome in term newborns and maternal postpartum hemorrhage.

METHODS. This was a randomized, controlled trial performed in 2 obstetrical units in Argentina on neonates born at term without complications to mothers with uneventful pregnancies. After written parental consents were obtained, newborns were randomly assigned to cord clamping within the first 15 seconds (group 1), at 1 minute (group 2), or at 3 minutes (group 3) after birth. The infants' venous hematocrit value was measured 6 hours after birth.

RESULTS. Two hundred seventy-six newborns were recruited. Mean venous hematocrit values at 6 hours of life were 53.5% (group 1), 57.0% (group 2), and 59.4% (group 3). Statistical analyses were performed, and results were equivalent among groups because the hematocrit increase in neonates with late clamping was within the prespecified physiologic range. The prevalence of hematocrit at <45% (anemia) was significantly lower in groups 2 and 3 than in group 1. The prevalence of hematocrit at >65% was similar in groups 1 and 2 (4.4% and 5.9%, respectively) but significantly higher in group 3 (14.1%) versus group 1 (4.4%). There were no significant differences in other neonatal outcomes and in maternal postpartum hemorrhage.

CONCLUSIONS. Delayed cord clamping at birth increases neonatal mean venous hematocrit within a physiologic range. Neither significant differences nor harmful effects were observed among groups. Furthermore, this intervention seems to reduce the rate of neonatal anemia. This

practice has been shown to be safe and should be implemented to increase neonatal iron storage at birth.

Randomized Controlled Trial Supports Delayed Cord Clamping for Term Infants

Ceriani Cernadas, J. M., Carroli, G., Pellegrini, L., Otaño, L., Ferreira, M., Ricci, C., Casas, O., Giordano, D., Lardizábal, J. (2006). The effect of timing of cord clamping on neonatal venous hematocrit values and clinical outcome at term: a randomized, controlled trial. *Pediatrics*, 117(4), e779-87. [[Abstract](#)]

Summary: In this prospective, multi-center trial researchers examined the effect of delayed cord clamping on iron-deficiency anemia and clinical outcomes in term newborns. Two hundred seventy-six healthy women with uncomplicated pregnancies were randomized to three groups: cord clamping immediately after birth, at 1 minute and at 3 minutes. Venous hematocrit (to measure anemia) and bilirubin (to measure pathologic jaundice) were drawn at 6 hours and 24-48 hours after birth. Newborn physical exams were performed by clinicians who did not know to which group the infant was assigned.

Anemia at 6 hours of age was significantly more common in newborns who were randomized to the immediate cord clamping group. There was also a significant difference at 24-48 hours of age (16.8% of newborns in the immediate clamping group versus 2.2% at 1 minute and 3.3% at 3 minutes). Significantly more infants in the 3-minute group had elevated hematocrit levels (polycythemia) at 6 hours of age. However, none of the polycythemic babies exhibited symptoms or required treatment, and this difference did not persist to 24-48 hours of age. There were no significant differences in bilirubin values, rates of neonatal adverse events, or the infants' weight gain and rate of exclusive breastfeeding in the first month of life. There were no significant differences in maternal outcomes such as blood loss or maternal hematocrit levels.

Significance for Normal Birth:

Immediate cord clamping is a practice that has been performed routinely for decades without evidence of benefit. Placental transfer of oxygenated blood, nutrients and stem cells continues for several minutes after birth. Physiologic principles suggest that the optimal transition to life outside the womb depends on this transfer. The study authors note that higher newborn iron levels at birth correlate with less likelihood of childhood anemia, a condition with long-term neurologic consequences. Some pediatricians recommend iron supplementation for breastfed infants, but it may be that by providing the full complement of iron, delayed cord clamping is the only iron supplement healthy babies need. As an added bonus, delayed cord clamping keeps babies in their mother's arms, the ideal place to regulate their temperature and initiate bonding and breastfeeding. This may be an important first step in promoting non-separation of mother and baby after birth.

Discussion Group

Early cord clamping deprives the baby of 54-160 mL of blood, which represents up to half of a baby's total blood

Topic: Retained Placenta

Question: *As the blood stops circulating through the placenta as the baby begins to oxygenate his*

own blood, the placenta is released as the blood vessels once rooted in the uterus are no longer in use. Is it not the disruption of this process through early cord clamping, leaving the placenta with excess blood and no cue to cease and release, that causes a great deal of pp hemorrhaging?

Response: Yes

Topic: Blood testing from placenta

We opted to collect cord blood, not for banking, but because my husband and I are carriers for a very serious disorder and have a one in four chance of passing it on to each child we birth. We needed info. ASAP after our child was born so that we could begin treating him to hopefully lessen the severity of the disorder.

We had a beautiful, wonderful home waterbirth and no one touched the cord until the placenta was birthed. As the placenta was floating in a bowl in the tub the midwife then clamped and cut the cord and carried the placenta to the kitchen counter. We needed a good amount of blood, which she was able to extract by inserting a needle into one of the vessels on the placenta and drawing it out. The exact number was something upwards of 20 cc's which she got with no problems at all. So in our case there was a good amount of blood remaining in the placenta after the birth of the baby and the placenta.

Topic: Rh positive babies and Rhogam injection

I wrote to Dr. Morley a few days ago when we were discussing Rhogam, etc. Here is his direct response.

There is no danger in leaving the cord alone until the placenta has delivered. Certified midwives do this routinely. If the child is Rh positive, like the husband, a Rhogam injection after birth (given to the mother) will prevent any sensitization to Rh pos. blood and prevent any problems.

GMM (Dr. Morley)

Topic: Patient's request

Question: I saw my doctor yesterday and gave him my birth plan; he read it fairly quickly and it didn't sound to me that he took it very seriously. He said it may not be possible to cut the cord only after the pulsation has stopped... He sometimes gets 8 patients having babies at the same time and he doesn't have time to wait for each of them (!).

He thinks that leaving the cord is not good for baby, there could be too much blood going in Baby. He compared the placenta to a water tank, it keeps extra blood but it doesn't belong all in baby (I believe the cord must stop pulsating once the baby has taken the amount it needs, so it probably doesn't empty the whole placenta; baby could not take more than it can handle.?)

The way they usually work at this hospital is that once the baby is out, they clean it's airwaves, clean him, cut the cord and the placenta comes out (he said it all takes about 5 minutes!). I don't know if that is the order they do things or not, it sounds to me that 5 minutes would be rushing things. I was hoping to get a better reaction; hopefully they will respect our wishes as much as possible.

Do you have any documents specifically on that subject that I could bring to my doctor next week?

Response: I'd say there isn't much to discuss. This doctor isn't honoring them or willing to work with them. How safe can they feel at the birth? If we don't feel safe our bodies kick into fight or

flight and then the snowball takes over. How can mom have a comfortable birth if she doesn't feel safe?

We wouldn't tolerate this kind of behavior in any other aspect of business. If you were buying a car and the salesman said sorry I can't let you take it for a test drive or answer any of your questions; I have 7 other customers who want me to help them too. I have one color with no options in the kind of car you want. I can't be bothered to order one for you. Take it or leave it. Would you buy a car there or go to another dealer with better service?

Or in another case if your doctor began to cut off your child's oxygen supply for a period of minutes at a routine doctor visit you would be appalled right? What if he told you he was going to do it before you went into the room and it was not for your child's benefit but his because he is busy? Would you still take your child in there? If the cord is clamped and cut immediately your child is being asphyxiated.

The following are established facts:

Birth asphyxia (lack of oxygen) causes newborn brain damage.

Before birth, the placenta supplies the brain with oxygen.

After birth, the lungs supply the brain with oxygen.

After the delivery of the child, and before delivery of the placenta, the oxygen supply changes from the placenta to the lungs.

During normal changeover, placental oxygenation continues until pulmonary oxygenation is established.

During normal changeover, the brain is not deprived of oxygen.

During normal changeover, placental blood is transfused into the child, increasing its blood volume.

The increased blood volume flows through the lungs augmented by ventilation to establish pulmonary oxygenation.

After pulmonary oxygenation is established, placental oxygenation ceases - the cord vessels close; the brain's oxygen supply is not interrupted.

The child's innate reflexes control all the above mechanisms and functions.

Those reflexes have been developed over millions of years for optimal survival of the newborn

Website Resources:

http://www.birhofafamily.com/research/options/Cord_Clamping-birthsource.htm

*Thought you might be pleased to hear a report that was on the noon news today. Studies are now showing that many babies are born iron deficient. They go on to say that it can be remedied by **delaying the cutting of the cord by 2 minutes or longer.***

Topic: Blood loss due to cord clamping

This business of the baby losing this or that or having too much of this or that is a fallacy. The blood from the two is separated by a thin membrane. The mother's blood with the oxygen and nutrients goes into a space between the baby's capillaries in the placenta called villi. It is then passed on to the baby through diffusion. It is not a direct flow. It stands to reason that the perfected reproductive system would not allow for blood to flow back and forth. Babies would all end up with anemia if it flowed back out of them.

Babies can and DO lose 20 to 50 percent of their blood volume during immediate cord clamp...but it stays within the cord/placenta mechanism, not flowing back into the mother. They DO frequently

become anemic at some point during their first year or years from this practice. Read the article on Physiology of the Cord Clamp on the left side of the web page.

*You know, if you were to have a terrible accident on the way home from work or something, and present by transport in the ER with loss of 50 percent of your adult blood volume, the place would be active as an ant mound trying to put you back together. Yet we do this to newborns every day out of total medical ignorance. As I said before, it's a testament to the human will to live and that indomitable human spirit that babies survive **in spite of** what we do to them, rather than **because** of it.*

I attended a birth as a doula yesterday and after mom reached 10 cm her doc came in and told her that research and studies have shown that immediate cord clamping, pitocin and cord traction reduces the risk of postpartum hemorrhage. She scared the crap out of dad and of course they agreed to all of it.

I am wondering what research has come out to say that immediate cord clamping reduces hemorrhage? Does anyone know? This makes no sense to me. How did our species survive so poorly designed as to hemorrhage if the cord wasn't immediately clamped? No clamps are available to animals yet they rarely hemorrhage.

I also remember reading an article that stated that cord traction could increase the risk of hemorrhage. Is anyone out there a research guru who can help me update my information?

I am wondering what research has come out to say that immediate cord clamping reduces hemorrhage? Does anyone know? This makes no sense to me. How did our species survive so poorly designed as to hemorrhage if the cord wasn't immediately clamped? No clamps are available to animals yet they rarely hemorrhage.

As a matter of fact immediate cord clamp most certainly can CAUSE serious post partum bleeding because the vessels in the mother which supply the placenta never get the appropriate message from the baby/cord/placental system that the balance of blood has transferred to the baby and no more support of the placenta is necessary. (I do not mean that the mother's blood is what is supplying the baby at the moment of birth! Read what I wrote carefully.)

When there is immediate cord clamp, when there is cord traction, this disrupts the body's natural process. And that's what causes problems more than anything. The word iatrogenic firmly applies here.

Supply him with the Physiology report from www.cordclamp.com.

This is rather a complex question that I have been puzzling over too. I have put this handout together for my clients to help them make an educated decision. One of my moms has anemia and this is a hot topic for her. She has talked with her midwife and they are doing a "blend". There should NEVER be strong traction on the cord . . . it becomes really ugly when it breaks.

The best part of the following online report is the "discussion section" which is found in the full Abstract at <http://pediatrics.aappublications.org/cgi/content/full/117/4/e779?eaf>.

Topic: Cord blood gases

The cord PH is the 'Cord Blood Gasses" of the baby at or near birth. They need to be within a certain range. If too low, it indicates the baby was short changed of oxygen (very broadly). If it is within the

normal range, this sort of gets the provider off the hook if there should be any problems with the baby. Some folks/hospitals/OB teams require it on every birth, whether or not there is a problem. It needs to be collected just perfectly and then put on ice to preserve the gas and be an accurate reading. It is different than Stem Cells, which are less fragile, and just a cord blood sample (for RH) which is just a blood clot. Each of these has different procedures, and if not collected correctly it can affect the end result. I believe the Cord Blood Gasses are the most critical.

<http://www.nlm.nih.gov/medlineplus/ency/article/003403.htm>

<http://www.obgyn.net/women/women.asp?page=/jr/review14>

Journal Article:

JAMA Journal of the American Medical Association

Vol. 297 No. 11, March 11, 2007 Vol. 297 No. 11, March 21, 2007 Vol. 297 No. 11, March 21, 2007

Late vs Early Clamping of the Umbilical Cord in Full-term Neonates Systematic Review and Meta-analysis of Controlled Trials

[http://jama.ama-](http://jama.ama-assn.org/cgi/content/abstract/297/11/1241?maxtoshow=&HITS=10&hits=10&RESULTFORMA)

[assn.org/cgi/content/abstract/297/11/1241?maxtoshow=&HITS=10&hits=10&RESULTFORMA](http://jama.ama-assn.org/cgi/content/abstract/297/11/1241?maxtoshow=&HITS=10&hits=10&RESULTFORMA)

[T=&fulltext=cord+clamping&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT](http://jama.ama-assn.org/cgi/content/abstract/297/11/1241?maxtoshow=&HITS=10&hits=10&RESULTFORMA)

Eileen K. Hutton, PhD; Eman S. Hassan, MBBCh

JAMA. 2007;297:1241-1252.

Context With few exceptions, the umbilical **cord** of every newborn is clamped and cut at birth, yet the optimal timing for this intervention remains controversial.

Objective To compare the potential benefits and harms of late vs early **cord clamping** in term infants.

Data Sources Search of 6 electronic databases (on November 15, 2006, starting from the beginning of each): the Cochrane Pregnancy and Childbirth Group trials register, the Cochrane Neonatal Group trials register, the Cochrane library, MEDLINE, EMBASE, and CINAHL; hand search of secondary references in relevant studies; and contact of investigators about relevant published research.

Study Selection Controlled trials comparing late vs early **cord clamping** following birth in infants born at 37 or more weeks' gestation.

Data Extraction Two reviewers independently assessed eligibility and quality of trials and extracted data for outcomes of interest: infant hematologic status; iron status; and risk of adverse events such as jaundice, polycythemia, and respiratory distress.

Data Synthesis The meta-analysis included 15 controlled trials (1912 newborns). Late **cord clamping** was delayed for at least 2 minutes (n = 1001 newborns), while early **clamping** in most trials (n = 911 newborns) was performed immediately after birth. Benefits over ages 2 to 6 months associated with late **cord clamping** include improved hematologic status measured as hematocrit (weighted mean difference [WMD], 3.70%; 95% confidence interval [CI], 2.00%-5.40%); iron status as measured by ferritin concentration (WMD, 17.89; 95% CI, 16.58-19.21) and stored iron (WMD, 19.90; 95% CI, 7.67-32.13); and a clinically important reduction in the risk of anemia (relative risk (RR), 0.53; 95% CI, 0.40-0.70). Neonates with late **clamping** were at

increased risk of experiencing asymptomatic polycythemia (7 studies [403 neonates]: RR, 3.82; 95% CI, 1.11-13.21; 2 high-quality studies only [281 infants]: RR, 3.91; 95% CI, 1.00-15.36).

Conclusions Delaying clamping of the umbilical cord in full-term neonates for a minimum of 2 minutes following birth is beneficial to the newborn, extending into infancy. Although there was an increase in polycythemia among infants in whom cord clamping was delayed, this condition appeared to be benign.

Author Affiliations: Department of Obstetrics and Gynecology, McMaster University, Hamilton, Ontario (Dr Hutton); and The Child and Family Research Institute (Dr Hutton), Western Regional Training Centre for Health Services Research (Dr Hassan), and Department of Health Care and Epidemiology (Dr Hassan), University of British Columbia, Vancouver.

Timing of Umbilical Cord Clamping at Birth in Full-term Infants

William Oh

JAMA. 2007;297:1257-1258.

[EXTRACT](#) | [FULL TEXT](#)

Additional Website Resources:

<http://www.lamaze.org/Portals/0/Research%20and%20Advocacy/Research%20Summaries/2006-7.htm>

Discussion Group

Topic: *High hematocrit and delayed clamping*

Question:

I received the below email from my homebirth mom. I've only read positive things about delayed cord clamping, so can someone please explain what the problem is here?

<<Some stuff came up about J's delivery. Her hemo something or other is still too high on the blood tests and the dr asked about her cord. He said that the cord should be cut soon after birth. I told him we waited for it to stop pulsing and that I had walked down the hall to the bedroom with her attached. He thinks she got the equivalent of a giant blood transfusion at birth as a result of that. He was shocked that I walked around with her attached. Her blood count is very high and if it doesn't settle down, we need to go to a hematologist to see if there is a genetic problem! Trying to just take one day at a time and not worry. . . .>>

I appreciate any advice anyone can give me.

Response:

The fetus normally has more red blood cells than a baby because they only get oxygen after mom has taken what she needs. After birth the liver breaks down the excess blood cells to get to the normal level for an air breather. If the baby gets too much blood and the liver is still a little immature or if the baby is premature by several weeks, the baby will have difficulty getting rid of these extra red blood cells and the baby will become jaundiced with yellow skin and the yellow whites of the eyes. This can be dangerous if the levels get too high. Breastfeeding as frequently as

possible and exposing the baby to sunlight on naked skin can help the body break this jaundice down and excrete it in the stool. If that doesn't work, they can place the baby under special lights that will break it down. So feed often and strip the baby down to a diaper and get it in the light through a window for a few hours a day being careful to avoid sunburn. But don't ignore this as too high levels can cause brain damage.

High hematocrit you said? I think these are the concerns:

<http://www.merck.com/mmhe/sec23/ch264/ch264r.html>

Dehydration can cause false high reading in blood work, esp the hematocrit--the blood is basically concentrated, so reads high. I'd say re-check after hydrating the baby, either with breast milk alone or water and breast milk.

Topic: Baby's position during delayed clamping

Question:

Discussing delayed clamping with a mom and her doctor. When we were talking about waiting for the cord to stop pulsing she said it is important that the baby stays parallel if you do this. She said if the baby is elevated too much (even on mom's chest) for too long, then blood is actually draining away from the baby toward the placenta. It seems that the opposite might have happened with your mom if she was carrying the baby below. Maybe too much blood could have flown toward the baby? Has anyone else ever heard of this before?

Response:

This is explained in great detail in *Holistic Midwifery, Vol. 2* in the chapter that begins on page 489. Please let your client know that if she held the baby and walked down the hall with the cord still attached, then it would not cause the baby to have a giant transfusion, because the blood would be flowing away from the baby. On the contrary, baby would have LESS blood if it worked that way.

Here is a snippet from the pages in HM: "Systemic Balance"

The possibility of damage to the brain and other organs from temporary cardiovascular overload is eliminated when the baby is kept close to the level of the placenta during most of the time the cord remains intact. (Dunn, 1966)

This is true because the vein, which has no valves, allows any excess blood to backflow toward the placenta. The baby has an opportunity to continue to equilibrate her blood flow during the pauses between contractions, as well as after the placenta is born. If the newborn is kept well below the level of the placenta the entire time that the cord remains intact, the transfusion will occur rapidly and the healthy baby will reflexively close his umbilical valve within the abdomen after receiving enough cord blood (Morley, 2002d).

Either way, a temporary overload cannot occur. However, the heart must work harder to push blood uphill, and a baby who has suffered asphyxia may be less capable of shutting off the flow at the umbilicus. For this reason, keeping the compromised baby below the placenta during stabilization and then level with the placenta while the cord remains intact allows the heart to return blood to the umbilical vein if necessary."

In reading the entire chapter in HM vol 2, it is very clear that the author advocates delayed cord clamping and the reliance on the physiological closure of the cord after the natural process of the baby equalizing his blood between body and placenta, taking what he needs and letting go of what

he doesn't. I certainly believe wholeheartedly in delayed clamping, especially when you see how the cord changes from fat, healthy, blood filled tube into a tiny thin little shoelace looking thing. It seems that God has designed it so that it's easier to detach WHEN THE TIME IS RIGHT.

I have met midwives who say that if a baby isn't breathing to cut the cord and it will force them to take a breath. I feel like leaving it intact as long as possible means that they are still getting oxygen infused blood from mom. Personally, in my training and in my own practice I prefer to keep it attached as long as possible, usually between an hour and two hours after the birth and then mom is ready to detach baby from the placenta. typically during this time moms are laying in bed nursing their babies, but sometimes she's getting out of the birth tub and/or walking to bed. I've never seen it to be a problem and I haven't seen jaundice or high hematocrit to be an issue with these babies. Also, THANK YOU for mentioning the dehydration thing.

Topic: Delayed clamping with twins

As for delayed clamping or no clamping with twins, the test answer is what you have already read- clamp right away to prevent the birthed twin from losing blood volume to the un-birthed twin. Now, I have had two sets of truly surprise twins--no ultrasound, so I didn't know there were two, I didn't know the number of placentas, I didn't clamp the cord, as no one knew another baby was coming. Nothing seemed to be drastically different from twin one and twin two... One set did have separate bags. Both were born in their own bags in the water, so there was no risk of twin-to-twin transfusion.

I say watch the baby that's out and, if you see a big skin color change, or an increase in the baby's heart rate--then clamp. I suspect no one really knows what is OK, as few are stopping and observing what really happens. So much of what we do at birth is by rote and no longer applies to natural un-drugged mother and baby directed births.

Leaving Well Alone: A Natural Approach to the Third Stage of Labour

By Dr Sarah Buckley (sarahjbuckley@yahoo.com)

<http://web.archive.org/web/20041011043451/www.cordclamping.com/Buckley.htm>

The medical approach to pregnancy and birth has become so ingrained in our culture, that we have forgotten the way of birth of our ancestors: a way that has ensured our survival as a species for millennia. In the rush to supposedly protect mothers and babies from misfortune and death, modern western obstetrics has neglected to pay its dues to the Goddess, to Mother Nature, whose complex and elegant systems of birth are interfered with on every level by this new approach, even as we admit our inability to understand or control these elemental forces. Medical interference in pregnancy, labour and birth is well documented, and the negative sequellae are well researched. However, medical management of the third stage of labour- the time between the baby's birth, and the emergence of the placenta-, to my mind, more insidious. At the time when Mother Nature prescribes awe and ecstasy, we have injections, examinations, and clamping and pulling on the cord. Instead of body heat and skin to skin contact, we have separation and wrapping. Where time should stand still for those eternal moments of first contact, as mother and baby fall deeply in love, we have haste to deliver the placenta and clean up for the next `case'.

This `management ` of the third stage, which has been taken even further in the last ten years, with the popularity of "active management of the third stage" (see below), which has its own

risks for mother and baby. While much of the activity is designed to reduce the risk of maternal bleeding, or postpartum haemorrhage (PPH), which is most certainly a serious event, it seems that, as with the active management of labour, the medical approach to labour and birth actually leads to many of the problems that this active management is designed to address.

Active management also creates specific problems for mother and baby. In particular, use of active management leads to a newborn baby being deprived of up to half of his or her expected blood volume. This extra blood, which is intended to perfuse the newly functioning lungs and other vital organs, is discarded along with the placenta when active management is used, with possible sequelae such as breathing difficulties and anaemia, especially in vulnerable babies.

Drugs used in active management have documented risks for the mother, including death, and we do not know the long-term effects of these drugs, which are given at a critical stage of brain development, for the baby.

Hormones in the third stage

As a mammalian species- that is, we have mammary glands that produce milk for our young- we share almost all features of labour and birth with our fellow mammals. We have in common the complex orchestration of labour hormones, produced deep within our "mammalian", or middle brain, to aid us and ultimately ensure the survival of our offspring.

We are helped in birth by three major mammalian hormone systems, all of which play important roles in the third stage as well. The hormone oxytocin causes the uterine contractions that signal labour, as well as helping us to enact our instinctive mothering behaviours. Endorphins, the body's natural opiates, produce an altered state of consciousness and aid us in transmuted pain: and the fight or flight hormones adrenaline and noradrenaline (epinephrine and norepinephrine- also known as catecholamines or CAs) give us the burst of energy that we need to push our babies out in second stage.

During the third stage of labour, strong uterine contractions continue at regular intervals, under the continuing influence of oxytocin. The uterine muscle fibres shorten, or retract, with each contraction, leading to a gradual decrease in the size of the uterus, which helps to "shear" the placenta away from its attachment site. Third stage is complete when the placenta is delivered.

For the new mother, the third stage is a time of reaping the rewards of her labour. Mother Nature provides peak levels of oxytocin, the hormone of love, and endorphins, hormones of pleasure for both mother and baby. Skin to skin contact and the baby's first attempts to breast feed further augment maternal oxytocin levels, strengthening the uterine contractions that will help the placenta to separate, and the uterus to contract down. In this way, oxytocin acts to prevent haemorrhage, as well as to establish, in concert with the other hormones, the close bond that will ensure a mother's care and protection, and thus her baby's survival.

At this time, the high adrenaline levels of second stage, which have kept mother and baby wide-eyed and alert at first contact, will be falling, and a very warm atmosphere is necessary to counteract the cold, shivering feelings that a woman has as her adrenaline levels drop. If the environment is not well heated, and/or the mother is worried or distracted, continuing high levels of adrenaline will counteract oxytocin's beneficial effects on her uterus, therefore, according to Odent (1992), increasing the risk of haemorrhage.

For the baby as well, the reduction in fight or flight hormones, which have also peaked at birth, is

critical. If, because of extended separation, these hormones are not soothed by contact with the mother, the baby can go into psychological shock which, according to author Joseph Chilton Pearce, will prevent the activation of specific brain functions that is nature's blueprint for this time. Pearce believes that the separation of mother and baby after birth is "the most devastating event of life, which leaves us emotionally and psychologically crippled" (Pearce 1992)

One might wonder whether the modern epidemic of "stress" - the term was invented by researchers in the early 20th century- and stress-related illness in our culture is a further outcome of current third-stage practices. It is scientifically plausible that our entire Hypothalamic-Pituitary-Adrenal (HPA) axis, which mediates long-term stress responses and immune function, as well as short-term fight-or-flight reaction, is permanently mis-set by the continuing high stress hormone levels that ensue when newborn babies are routinely separated from their mothers.

Michel Odent, in his review of research on the "primal period" (the time between conception and the first birthday), concludes that interference or dysfunction at this time affects the development of our "capacity to love", which is particularly vulnerable around the time of birth, being connected hormonally to the oxytocin system. (Odent, 1998) Research by Jacobsen (1990, 1997)) and Raine (1994), among others, suggests that contemporary tragedies such as suicide, drug addiction and violent criminality may be linked to problems in the perinatal period such as exposure to drugs, birth complications and separation or rejection from the mother.

A crucial role for birth attendants in these times is to ensure that a woman's mammalian instincts are protected and valued during pregnancy, birth and afterwards. Ensuring unhurried and uninterrupted contact between mother and baby after birth, adjusting the temperature to accommodate a shivering mother, and to allow skin-to-skin contact and breastfeeding, and not removing the baby for any reason- these are practices that are sensible, intuitive and safe, and help to synchronise our hormonal systems with our genetic blueprint, giving maximum success and pleasure for both partners, in the critical function of child-rearing.

The baby, the cord, and active management

Adaptation to life outside the womb is the major physiological task for the baby in third stage. In utero, the wondrous placenta fulfills the functions of lungs, kidney, gut and liver for our babies. Blood flow to these organs is minimal until the baby takes a first breath, at which time huge changes begin in the organisation of the circulatory system

Within the baby's body, blood becomes, over several minutes, diverted away from the umbilical cord and placenta and, as the lungs fill with air, blood is sucked into the pulmonary (lung) circulation. Mother Nature ensures a reservoir of blood in the cord and placenta, that provides the additional blood necessary for these newly-perfused pulmonary and organ systems.

The transfer of this reservoir of blood from the placenta to the baby happens in a step-wise progression, with blood entering the baby with each third-stage contraction, and some blood returning to the placenta between contractions. Crying slows the intake of blood, which is also controlled by constriction of the vessels within the cord (Gunther 1957) – both of which imply that the baby may be able to regulate the transfusion according to individual need.

Gravity will affect the transfer of blood, with optimal transfer occurring when the baby remains at or below the level of the uterus until the cessation of cord pulsation signals that the transfer is complete. This process of "physiological clamping" typically takes 3 minutes, but may be longer,

or can be complete in only one minute. (Linderkamp 1982)

This elegant and time-tested system, which ensures that an optimum, but not a standard, amount of blood is transferred, is rendered inoperable by the current practice of early clamping of the cord- usually within 30 seconds of birth.

Early clamping has been widely adopted in Western obstetrics as part of the package known as active management of the third stage. This comprises the use of an oxytocic agent- a drug that, like oxytocin, causes the uterus to contract strongly- given usually by injection into the mother's thigh as the baby is born, as well as early cord clamping, and 'controlled cord traction'- that is, pulling on the cord to deliver the placenta as quickly as possible.

Haste becomes necessary, because the oxytocic injection will, within a few minutes, cause very strong uterine contractions that can trap an undelivered placenta, making an operation and 'manual removal' necessary. Furthermore, if the cord is not clamped before the oxytocic effect commences, the baby is at risk of having too much blood suddenly pumped from the placenta by the over-zealous contractions.

While the aim of active management is to reduce the risk of haemorrhage for the mother, "its widespread acceptance was not preceded by studies evaluating the effects of depriving neonates [newborn babies] of a significant volume of blood" (Piscane 1996)

It is estimated that early clamping deprives the baby of 54 to 160 ml of blood, (Usher 1963) which represents up to half of a baby's total blood volume at birth. "Clamping the cord before the infant's first breath results in blood being sacrificed from other organs to establish pulmonary perfusion.[blood supply to the lungs].Fatality may result if the child is already hypovolemic [low in blood volume]." (Morley 1997)

Where the baby is lifted above the uterus before clamping- for example during caesarean surgery- blood will drain back to the placenta by gravity, making these babies especially liable to receive less than their expected blood volume. The consequence of this may be an increased risk of respiratory (breathing) distress- several studies have shown this condition, which is common in caesarean-born babies, to be eliminated when a full placental transfusion was allowed. (Peltonen 1981, Landau 1953).

The baby whose cord is clamped early also loses the iron contained within that blood- early clamping has been linked with an extra risk of anaemia in infancy. (Grajeda 1997, Michaelson 1995).

These sequelae of early clamping were recognised as far back as 1801, when Erasmus Darwin wrote

"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" (Darwin 1801))

In one study, premature babies experiencing delayed cord clamping-, the delay was only 30 seconds- showed a reduced need for transfusion, less severe breathing problems, better oxygen levels, and indications of probable improved long-term outcomes, compared to those whose cords were clamped immediately. (Kinmond 1993).

Some studies have shown an increased risk of polycythemia (more red blood cells in the blood) and jaundice when the cord is clamped later. Polycythemia may be beneficial, in that more red cells means more oxygen being delivered to the tissues. The risk that polycythemia will cause the blood to become too thick (hyperviscosity syndrome), which is often used as an argument against delayed cord clamping, seems to be negligible in healthy babies. (Morley 1998)

Jaundice is almost certain when a baby gets his or her full quota of blood, and is caused by the breakdown of the normal excess of blood to produce bilirubin, the pigment that causes the yellow appearance of a jaundiced baby. There is, however, no evidence of adverse effects from this. (Morley 1998). One author has proposed that jaundice, which is present in almost all human infants to some extent, and which is often prolonged by breastfeeding, may actually be beneficial because of the anti-oxidant properties of bilirubin. (Gartner 1998)

Early cord clamping carries the further disadvantage of depriving the baby of the oxygen-rich placental blood that mother nature provides to tide the baby over until breathing is well established. In situations of extreme distress- for example, if the baby takes several minutes to breathe-this reservoir of oxygenated blood can be life saving, but, ironically, standard practice is to cut the cord immediately if resuscitation is needed.

The placental circulation acts, when the cord is intact, as a conduit for any drug given to the mother, whether during pregnancy, labour or third stage. Garrison (1999) reports that Narcan, which is sometimes needed by the baby to counteract the sedating effect of pain-relieving drugs such as pethidine (demorol), given to the mother in labour, can be effectively administered via the mother's veins in third stage, waking up the newborn baby in a matter of seconds.

The recent discovery of the amazing properties of cord blood, in particular the stem cells contained within it, heightens, for me, the need to ensure that a newborn baby gets its full quota. These cells are unique to this stage of development, and will migrate to the baby's bone marrow soon after birth, transforming themselves into various types of blood-making cells,

Cord blood harvesting, which is currently being promoted to fill Cord Blood Banks for future treatment of children with leukaemia, involves immediate clamping, and up to 100 ml of this extraordinary blood can be taken from the baby to whom it belongs. Perhaps this is justifiable where active management is practiced, and the blood would be otherwise discarded, but, unfortunately, cord blood donation is incompatible with a physiological (natural) third stage.

Active management and the mother

Active management (oxytocic, early clamping and controlled cord traction) represents a further development in third stage interference that began in the mid-seventeenth century, when male attendants began confining women to bed, and cord clamping was introduced to spare the bed linen.

Pulling on the cord was first recommended by Mauriceau in 1673, who feared that the uterus might close before the placenta was spontaneously delivered (Inch 1984). In fact, the recumbent (lying) postures, increasingly adopted under doctor's care meant that spontaneous delivery of the placenta was less likely: the upright postures that women and midwives have traditionally used encourage the placenta to fall out with the help of gravity.

The first oxytocic to be used medically was ergot, derived from a fungal infection of rye. Ergot was known to be used by 17th and 18th century European midwives. Its use was limited, however,

by its toxicity. It was refined and revived as ergometrine in the 1930's, and by the late 1940's, some doctors were using it as a preventative, as well as therapeutically, for post partum haemorrhage. (Inch 1984) Potential side effects from ergot derivatives include a rise in blood pressure, nausea, vomiting, headache, palpitations, cerebral haemorrhage, cardiac arrest, convulsion and even death.

Synthetic oxytocin, which mimics the effects of natural oxytocin on the uterus, was first marketed in the 1950's, and has largely replaced ergometrine, although a combination drug, called syntometrine, is still used, especially for severe haemorrhage. Syntocinon causes an increase in the strength of contractions, whereas ergometrine causes a large, 'tonic' contraction, which also increases the chance of trapping the placenta. Ergometrine also interferes with the process of placental separation, increasing the chance of partial separation. (Sorbe 1978)

Recently active management has been proclaimed "the routine management of choice for women expecting a single baby by vaginal delivery in a maternity hospital" (Prendville 1999), mostly because of the results of the recent Hinchingsbrooke trial, comparing active versus "expectant" (physiological) management.

In this trial (Rogers 1998), which involved only women at low risk of bleeding, active management was associated with a post partum hemorrhage (blood loss greater than 500ml) rate of 6.8%, compared with 16.5% for expectant (non-active) management. Rates of severe PPH (loss > 1000ml) were low in both groups- 1.7% active and 2.6% expectant.

The authors note further that, from these figures ten women would need to receive active management to prevent one PPH. They add "Some women ... may rate a small personal risk of PPH of little importance compared with intervention in an otherwise straightforward labour, whereas others may wish to take all measures to reduce the risk of PPH."

Reading this paper, one must wonder how it is that almost 1 in 6 women bled after "physiological" management, and whether one or more components of western obstetric practices might not be actually increasing the rate of haemorrhage.

Botha (1968) attended over 26 000 Bantu women over 10 years, and reports that "a retained placenta was seldom seen...blood transfusion for postpartum haemorrhage was never necessary." Bantu women deliver both baby and placenta while squatting, and the cord is not attended to until the placenta delivers itself by gravity.

There is some evidence that the practice of clamping the cord, which is not practiced by indigenous cultures, contributes to both PPH and retained placenta by trapping extra blood (around 100ml, as described above) within the placenta. This increases placental bulk, which the uterus cannot contract efficiently against, and which is more difficult to expel. (Walsh 1968)

Other western practices that may contribute to PPH include the use of oxytocin for induction and augmentation (speeding up labour) (Brinsden 1978, McKenzie 1979), episiotomy or perineal trauma, forceps delivery, caesarean and previous caesarean (because of placental problems- see Hemminki 1996).

Gilbert (1987) notes that PPH rates in her UK hospital more than doubled from 5% in 1969-70 to 11% in 1983-5, and concludes "The changes in labour ward practice over the last 20 years have resulted in the re-emergence of PPH as a significant problem." In particular, she links an increased risk of bleeding with induction using oxytocin, forceps delivery, long first and second

stages (but not prolonged pushing) and the use of epidurals, which increase the chance of forceps and of a long second stage.

As noted, western practices do not facilitate the production of a mother's own oxytocin, neither is attention paid to reducing adrenaline levels in the minutes after birth, both of which are physiologically likely to improve uterine contractions and therefore reduce haemorrhage.

Clamping the cord, especially at an early stage, may also cause the extra blood trapped within the placenta to be forced back through the placenta into the mother's blood supply with the third stage contractions. (Doolittle 1966, Lapidó 1971) This "feto-maternal transfusion" increases the chance of future blood group incompatibility problems, which occur when the current baby's blood enters the mother's blood stream, causing an immune reaction which can be reactivated and destroy the baby's blood cells in a subsequent pregnancy, causing anaemia or even death.

The use of oxytocin, which strengthens contractions, either during labour, or in third stage, has also been linked to an increased risk of feto-maternal hemorrhage and blood group incompatibility problems. (Beer 1969, Weinstein 1971)

The World Health Organisation, in its 1996 publication *Care in Normal Birth: a practical guide*, argue that "In a healthy population (as is the case in most developed countries), postpartum blood loss up to 1000 ml may be considered as physiological and does not necessitate treatment other than oxytocics...". In relation to routine oxytocics and controlled cord traction, WHO cautions that "Recommendation of such a policy would imply that the benefits of such management would offset and even exceed the risks, including potentially rare but serious risks that might become manifest in the future."

Choosing a natural third stage

Choosing to forego preventative oxytocics, to clamp late (if at all), and to deliver the placenta by our own effort all require forethought, commitment, and that we choose birth attendants that are comfortable and experienced with these choices.

A natural third stage is more than this, however-we must ensure respect for the emotional and hormonal processes of both mother and baby, remembering how unique this time is. Michel Odent stresses the importance of not interrupting, even with words, and believes that ideally the new mother feels unobserved and uninhibited in the first encounter with her baby. (Odent 1992) This level of non-interference is uncommon, even in home and birth centre settings.

Lotus birth, the subject of this book, gives us a further chance to "slow the fire drill" after birth, as midwife Gloria Lemay puts it, and allows our babies the full metaphysical, as well as physical, benefit of prolonged contact with the placenta. Lotus birth, like a good midwife, also secludes mother and baby in the early hours and days, ensuring rest and keeping visitors to a minimum.

Third stage represents a first meeting, creating a powerful imprint upon the relationship between mother and baby. When both are undrugged and quiet, fully present and alert, new potentials are invoked, and we discover more about ourselves, and the sacred origins of our capacity to love.

*This paper was excerpted from the book **Lotus Birth**, compiled by Shivam Rachana, available from golden@xtreme.net.au and was published in Midwifery Today in 2001. Sarah Buckley can be reached at sarahjbuckley@yahoo.com.*