

A Survey of Umbilical Cord Clamping Practices and Attitudes of Canadian Maternity Care Providers

Survol des pratiques en matière de clampage du cordon ombilical et des attitudes des fournisseurs de soins obstétricaux canadiens

by Kathrin Stoll, PhD and Eileen Hutton, PhD

ABSTRACT

Despite mounting evidence of the health benefits of delayed cord clamping of term and preterm neonates, Canadian practice guidelines about the optimal timing of cord clamping have not been developed. At the time the study was conducted, the Society of Obstetricians & Gynecologists of Canada (SOGC) recommended early clamping as part of active management, while findings from several randomized controlled trials pointed at reported benefits of delayed cord clamping. It is unclear how Canadian maternity care providers were interpreting the evidence around umbilical cord clamping and what they do in clinical practice.

A link to an online survey was distributed to members of the Canadian Association of Midwives (CAM) and the SOGC to assess maternity care providers' umbilical cord clamping practices and attitudes. Respondents were asked to answer questions pertaining to the timing of cord clamping, reasons for cord clamping practices and perceived benefits and risks associated with delayed cord clamping (> 60 seconds) for 1) term and 2) preterm infants (< 37 weeks).

A total of 353 respondents met eligibility criteria (i.e. they provided intrapartum care at the time of data collection). The majority of obstetricians (77.9%) reported clamping the cord of term infants immediately (< 30 seconds), compared to 60.0% of family physicians and 9.8% of midwives; 6.5% of obstetricians, 9.1% of family physicians and 65.7% of midwives reported delaying cord clamping by two minutes or more. Midwives were more likely than physicians to make a conscious decision about the timing of cord clamping. Care providers reported higher rates of immediate cord clamping with preterm infants, compared to term infants, with 85% of physicians and 39% of midwives clamping the cord of preterm neonates within 30 seconds. The most common reason for clamping the cord of a term neonate immediately was the infants' need for resuscitation or other medical interventions (79%). Personal routine was the most frequently cited reason for clamping the cord of a preterm infant immediately (40%).

Findings from this survey highlight interprofessional variations in cord clamping practices. Clear practice guidelines around the optimal timing of cord clamping should be developed that take into considerations the health benefits of delaying cord clamping of term and preterm infants.

KEY WORDS

survey, attitudes, maternity care providers, cord clamping, clinical guidelines

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RÉSUMÉ

Malgré des données de plus en plus concluantes quant aux bienfaits du clampage différé du cordon chez les nouveau-nés prématurés et à terme, aucune directive clinique canadienne quant au meilleur moment pour effectuer le clampage du cordon n'a été élaborée. À l'époque où l'étude a été menée, la Société des obstétriciens et gynécologues du Canada (SOGC) recommandait un clampage précoce dans le cadre d'une prise en charge active, tandis que les résultats de plusieurs essais comparatifs randomisés montraient les bienfaits d'un clampage différé. On ne comprend pas exactement comment les fournisseurs de soins obstétricaux canadiens interprétaient les données de l'époque au sujet du clampage du cordon ombilical ni ce qu'ils font aujourd'hui dans le cadre de leur pratique clinique.

Un lien vers un sondage en ligne a été envoyé aux membres de l'Association canadienne des sages-femmes (ACSF) et de la SOGC, afin d'évaluer les pratiques et les attitudes des fournisseurs de soins obstétricaux en ce qui concerne le clampage du cordon ombilical. On a demandé aux participants de répondre à des questions qui traitaient du moment choisi pour le clampage du cordon, des raisons motivant les pratiques en matière de clampage du cordon et des avantages et des risques perçus qui sont associés au clampage différé du cordon (> 60 secondes) chez 1) les nouveau-nés à terme et 2) les nouveau-nés prématurés (< 37 semaines).

Au total, 353 répondants ont respecté les critères d'admissibilité (c.-à-d. qu'ils fournissaient des soins intrapartum au moment de la collecte des données). La majorité des obstétriciens (77,9 %) ont dit effectuer le clampage sur-le-champ dans le cas des nouveau-nés à terme (< 30 secondes), par comparaison avec 60,0 % des médecins de famille et 9,8 % des sages-femmes; de plus, 6,5 % des obstétriciens, 9,1 % des médecins de famille et 65,7 % des sages-femmes ont signalé qu'ils différeraient le clampage du cordon d'au moins deux minutes. Les sages-femmes étaient plus susceptibles que les médecins de décider consciemment du moment le plus propice pour effectuer le clampage du cordon. Les fournisseurs de soins ont signalé un taux plus élevé de clampage immédiat du cordon dans le cas des nouveau-nés prématurés (par comparaison avec ce qui se produit dans le cas des nouveau-nés à terme), 85 % des médecins et 39 % des sages-femmes optant pour un clampage du cordon dans les 30 secondes suivant la naissance. La raison la plus couramment invoquée pour le clampage immédiat du cordon dans le cas d'un nouveau-né à terme était la nécessité de procéder à la réanimation ou à d'autres interventions médicales chez ce dernier (79 %). La pratique habituelle personnelle était la raison invoquée le plus souvent pour justifier le clampage immédiat du cordon chez un nouveau-né prématuré (40 %).

Les résultats de ce sondage font ressortir les variations interprofessionnelles en matière de clampage du cordon. On doit élaborer des lignes directrices claires quant au meilleur moment pour effectuer le clampage du cordon et qui tiennent compte des bienfaits du clampage différé du cordon pour la santé des nouveau-nés à terme et prématurés.

MOTS-CLÉS :

Formation; éducation en pratique sage-femme; complications du travail; dystocie de l'épaule; simulation de patiente

Cet article a été évalué par des pairs.

INTRODUCTION

Debate about the appropriate time to clamp and cut the newborn infant's umbilical cord dates back many decades. In 2000 the Society of Obstetricians and Gynecologists of Canada (SOGC) issued practice guidelines around the management of the third stage of labour that included the recommendation to clamp the cord immediately after birth. Based on new evidence from two meta-analyses^{1,2} the SOGC revised their guideline in 2009.³ The new guideline states that cord clamping should be delayed by at least 60 seconds in premature newborns (< 37 weeks' gestation) because of the reduced risk of intraventricular hemorrhage and reduced need for transfusion among infants that were clamped late. For term newborns, the guideline states that clinicians should weigh the increased risk of neonatal jaundice against the benefits of delayed cord clamping, i.e greater hemoglobin and iron levels up to six months postpartum.³

At the time the current study was conducted (2006/2007), no Cochrane review or meta-analysis about the effect of the timing of cord clamping on term infants had been published. One Cochrane review⁴ of preterm infants concluded that delayed clamping (beyond 30 seconds) was associated with increased hematocrit values, decreased prevalence of anemia, decreased rates of intraventricular haemorrhage and decreased need for blood transfusions for anemia and low blood pressure.

Obstetric practices that have the potential to improve neonatal outcomes at no additional costs to the healthcare system warrant serious consideration, yet there is very little information about how Canadian practitioners view timing of cord clamping, and no evidence of what they do in practice. To bridge this gap, we conducted a two-part study of cord clamping practices and attitudes among Canadian maternity care providers. The first part of this study (reported in full elsewhere) involved observations of 89 vaginal singleton deliveries > 37 weeks gestation on randomly selected days between October 2006- April 2007 at BC Women's Hospital in Vancouver, British Columbia. Research assistants recorded the timing of umbilical cord clamping with a stop watch which was started at the time the infant was born to the umbilicus, and stopped when the first clamp was applied to the

cord. Findings from the observational study pointed to significant inter and intraprofessional variations in cord clamping practices. Obstetricians clamped earliest (median time: 12 seconds) and showed the least variations in the timing of clamping. Midwives clamped latest (median time: 81 seconds), with significant variation among individual midwives. Family physicians fell in between with a median clamping time of 19 second. The cord was clamped earlier in case of neonatal complications, when cord gases were taken and when the mother had an instrumental vaginal delivery.⁵

Literature Review

We identified three other studies that reported on cord clamping practices of maternity care providers⁶⁻⁸; all used a survey design. The first study was conducted in 1998 to explore the cord clamping attitudes of 157 American nurse-midwives.⁶ The aim of the study was to determine how Certified Nurse Midwives (CNM) manage normal and distressed infants and what evidence they use to guide their cord clamping practices. When caring for women with a normal delivery, 26.1% clamped the cord before one minute, 35.7% clamped between 1-3 minutes, and 33.1% waited three minutes or more. Cord clamping practices did not vary by age, years of experience and number of births attended. The early clampers cited that immediate clamping of distressed infants facilitates neonatal resuscitation, whereas late clampers felt that these infants would benefit from increased oxygenation and gradual transition to extra uterine life. The most common resources that informed their cord clamping practices were *Varney's Midwifery* and *Williams Obstetrics*. However, a large number of surveyed CNM's reported no references for their cord clamping practices (78%) despite evidence from randomized controlled trials that delayed clamping carries benefits for term and preterm infants.

A small survey (n=43) revealed that 9.3% of obstetricians always followed evidenced based recommendations to delay cord clamping by at least 30 seconds⁷, 53.4% did so on some occasions and 37.2% never practised delayed cord clamping when delivering preterm infants. The most commonly cited reason for not delaying cord clamping was difficulties

continued on page 25....

The Planned Child

by Sharon Olds

I hated the fact that they had planned me, she had taken
a cardboard out of his shirt from the laundry
as if sliding the backbone up out of his body,
and made a chart of the month and put
her temperature on it, rising and falling,
to know the day to make me -- I would have
liked to have been conceived in heat,
in haste, by mistake, in love, in sex,
not on cardboard, the little x on the
rising line that did not fall again.
But when a friend was pouring wine
and said that I seem to have been a child who had been wanted,
I took the wine against my lips
as if my mouth were moving along
that valved wall in my mother's body, she was
bearing down, and then breathing from the mask, and then
bearing down, pressing me out into
the world that was not enough for her without me in it,
not the moon, the sun, Orion
cartwheeling across the dark, not
the earth, the sea – none of it
was enough, for her, without me.

From: "The Wellspring" (Page 5, 1995)

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ABOUT THE POEMS

by Sharon Olds

“First Birth”

I think, in the moments before the first line was written down, before I knew there was a poem there, about to be written, it would have suddenly struck me -- or maybe I was writing in my diary -- that before my firstborn was born I knew so little about her. And then her birth -- she -- had changed my life, shown me the power of “creation” (“reproduction” -- arrival of someone new) and of existence, and of her unique being! Then, as I was writing the poem, it would have come to me as a little revelation -- all those firsts.

The poem was written a long time ago, in the first flush of our feeling that women’s ordinary lives had been so little sung. Therefore I think, I hope, the “I” may be not so much egotistical as representative. (And may I say that I wrote of the speaker-of-the-poem’s eyes rounded in shock and awe many years before the phrase was used by the American Right Wing to describe the hoped-for effect of its imperial policy in the war in Iraq.)

“The Planned Child”

I like that the poem starts with “I hated” -- passionate ambivalence many of us feel about our origins! I imagine that the friend in the second stanza had said what s/he said, which had then stirred the memory and emotion. And then the wine, the birth-canal, the mask, all combined to represent the world the speaker’s mother had wanted the speaker in. (Since the thoughts and feelings have passed over into, and are embodied in, a work of art, I’m happier talking about the speaker of the poem, the I of the poem, and the speaker’s mother, rather than using more personal terms.

Of course we know who that speaker is! But with my own work and everyone else’s I like to use the less intimate terms of art -- since a poem is not a diary entry but desired to be useful to others too.) I’m sure I did not see the last five lines until the bearing down and pressing out was written -- then I was able to sing the positive, with gratitude. (And, for me, the irregular length of the lines looks right for the informal moment-to-moment unfolding of the story, and the organic informal rough shapeliness of the song and its freight.)

ABOUT THE POET

Sharon Olds

Sharon Olds is an American author of nine books of poetry. *The Dead and the Living* received the National Book Critics Circle Award; *The Unswept Room* was a finalist for the National Book Award and The National Book Critics Circle Award, and *One Secret Thing* was a finalist for the Forward Prize (USA). She teaches at New York University’s Graduate Program in Creative Writing where she has been involved with N.Y.U.’s outreach workshops. The Goldwater Hospital workshop is in its 27th year and the newest workshop is for veterans of Iraq and Afghanistan. Her collection of poetry, *Stag’s Leap*, will be out in the fall of 2012. She lives in New York City and New Hampshire.

by Chris Sternberg

artwork

Dwelling Places:

Artwork by Jeanne Lyons, RM, MA

*Part Two: Continued from Summer 2012 edition.
See Volume 11, No. 2, for full artist commentary.*

Top:
Within the Divine Matrix
graphite on paper

Below Left:
Wombscape III
pastel, graphite & coloured pencil on paper

Below Right:
Wombscape IV
pastel, graphite & coloured pencil on paper



to implement it in clinical practice (78.2%). Among obstetricians who never delay clamping of the cord with preterm infants, 50% were unaware of the evidence that advocates delayed clamping. Some were aware of the evidence, but did not believe it (6.2%).

A 2005 study (n=287) about how British Columbian maternity care providers manage the third stage of labour included questions about cord clamping practices.⁸ There were significant differences in cord clamping practices among obstetricians, family physicians and midwives. Seventy-seven point nine percent of obstetricians reported early clamping, compared to 69.9% of family physicians and 2.2% of midwives. Late clamping was practiced by 1.3% of obstetricians, 3.7% of family physicians and 60.9% of midwives. The authors did not report whether they defined early and late clamping and whether they distinguished between cord clamping practices of term versus preterm infants.

PUPROSE

In this study we describe the attitudes and variations in practice among perinatal care providers across Canada with regards to the timing of umbilical cord clamping of preterm and term infants.

METHODS

We developed an online survey tool that included questions about care providers' cord clamping practices and attitudes. For example, we asked questions about the timing of cord clamping in term and preterm infants, circumstances of early and delayed clamping

and perceived risks and benefits associated with delayed clamping of term and preterm neonates. With the exception of the question about the timing of cord clamping, participants were asked to choose from a list of options and encouraged to check as many responses as apply. In the last section of the survey we assessed whether and why maternity care providers have changed cord clamping practices over the past 12 month. The survey also allowed respondents to provide open-ended comments to elaborate on their cord clamping beliefs and practices. The survey was developed using online survey software (Survey Monkey) and was pilot tested with five perinatal care providers from the University of British Columbia. These care providers suggested minor changes.

We collaborated with CAM and the SOGC to distribute the survey link via e-mail. CAM sent the survey link to 606 midwives and the SOGC to 1211 obstetricians/gynecologists, 475 medical doctors, 130 midwives and 150 life members. The link to the survey was also distributed to family physicians, obstetricians and midwives at BC Women's Hospital in Vancouver. Some practitioners received the survey twice. A search for matching demographic information was performed to ensure that only one survey per respondent was submitted. Data collection took place between August 2006 and January 2007.

ANALYSIS

Data were exported from Survey Monkey into SPSS version 14. Respondents who indicated that they were not currently providing intrapartum care were

Table 1: Self reported timing of umbilical cord clamping for term infants by care provider group (n=275)

Type of maternity care provider	N	0 - 30s (%)	31 - 60s (%)	60 - 120s (%)	> 120s (%)
Obstetricians	77	77.9	14.3	1.3	6.5
Family physicians	55	60.0	21.8	9.1	9.1
Midwives	143	9.8	14.0	10.5	65.7

Pearson Chi-Square = 136.43, df=6, p< 0.001

Note: The analysis excludes providers who checked other (n=69) or I don't know (n=3). Six providers did not answer the question pertaining to timing of cord clamping of term infants.

excluded from data analysis. Term and preterm cord clamping times were recoded into four categories: 0-30 seconds, 31-60 seconds, 61-120 seconds and > 120 seconds. Interprofessional variations in self-reported cord clamping practices were examined by using descriptive statistics and Pearsons chi-square (goodness of fit) test.

RESULTS

Sample characteristics

In total, 353 maternity care providers who returned surveys met the inclusion criteria. More than half of respondents were midwives (54%), 24% obstetricians, 21% family practitioners and 1% maternal fetal medicine specialists. For subsequent analyses maternal fetal specialists were assigned to the obstetrician group. Responses were received from maternity care providers from each province and territory, but most responses came from Ontario (46%), British Columbia (17%), Quebec (13%) and Alberta (9%). Respondents had provided between 6 months to 40 years of maternity care, with an average of 13.4 years of practice. Forty-three per cent had privileges at a center with a NICU, 32% in a center with a special care nursery and 15% in a center with a regular care nursery (other = 10%).

Cord clamping practices with term infants

Fifty-eight percent of practitioners reported that they make a conscious decision about the timing of umbilical cord clamping when delivering term infants. Of the respondents who reported making a

conscious decision, 70% were midwives, 16% family physicians and 14% obstetricians. The self reported timing of umbilical cord clamping for term infants varied significantly among maternity care providers. (see Table 1).

Twenty percent of respondents did not choose one clamping time, but checked the option 'Other'. An examination of open-ended responses revealed that in some cases the timing of cord clamping depended on the birth setting. One respondent wrote: "At hospital births we are required to obtain cord blood samples, so I clamp and cut pretty much immediately (at about 30 seconds). At a home birth we do not collect cord blood samples routinely, and I usually wait for the cord to stop pulsating."

Some maternity care providers viewed the timing of cord clamping as a decision that should be made by the parturient woman and her partner, after a discussion of the pros and cons of early versus delayed cord clamping. A care provider explained as follows: "This is an informed choice discussion with parents about risks/benefits and community standard (hospital protocol requires early cord clamping and collection of cord gases). If parents do not have a preference then I usually clamp within 11-20 sec. as per the hospitals' protocol. Otherwise I follow parents' choice and clamp after the cord stops pulsating."

Other care providers described how the timing of cord clamping depends on the condition of the infant. "[The timing of cord clamping] varies with clinical circumstances. If the cord requires immediate (0-15 seconds) clamping for reasons of infant resuscitation

Table 2: *Self reported timing of umbilical cord clamping for preterm infants by care provider group (n=176)*

Type of maternity care provider	N	0 - 30s (%)	31 - 60s (%)	60 - 120s (%)	> 120s (%)
Obstetricians	74	85.1	10.8	1.4	2.7
Family Physicians	35	85.7	8.6	0	5.7
Midwives	67	38.8	14.9	7.5	38.8

Pearson Chi-Square = 49.713, p< 0.001

Note: The analysis excludes providers who checked other (n=53) or I don't know (n=5), missing data (n=2).

or because of a tight nuchal cord, then that will be done. Otherwise, I clamp the cord when I get around to doing so in the normal sequence of events [...].”

Many care providers gave reasons for immediate clamping of the umbilical cord (i.e., within five seconds) of a term infant. The most frequently cited reasons were: the infants’ need for resuscitation or other medical interventions (79%); followed by the collection of umbilical cord stem cells (47%); and delivery via cesarean section (26%). Other reasons for immediate clamping were personal routine (14%), the need to reduce the amount of maternal blood loss (11%) and the need to place the infant on the mother’s abdomen (9%). When asked why respondents would delay clamping the umbilical cord (beyond 30 seconds), 62% reported parental requests; 46% indicated that they delay clamping routinely; and 13% indicated other reasons. Maternity care providers associated several benefits with delayed cord clamping. The most frequently cited benefit was increased iron stores (62%); followed by reduced risk for anemia (55%); and increased blood flow to vital organs (40%); less need for blood transfusions (23%); and fewer cases of low blood pressure (15%). The most frequently cited risks associated with delayed clamping were increased risk of developing jaundice (39%) and polycythemia (32%) and delays in resuscitation (30%).

Cord clamping practices with preterm infants

Those who indicated that they did not deliver preterm babies (n=117) were removed from this part of the analyses. Nearly 60% of practitioners who deliver preterm infants made a conscious decision about the timing of umbilical cord clamping. Of the respondents who reported making a conscious decision, 79 (57%) were midwives, 34 (25%) family physicians, and 25 (18%) obstetricians. Reported timing of umbilical cord clamping of preterm infants differed significantly among maternity care provider groups (see Table 2).

Fifty-three respondents did not choose one clamping time, but checked the option ‘Other’. Most respondents who chose this option explained that the timing of cord clamping depends on the condition of the baby and whether it requires resuscitation or other interventions. A respondent explained that it

“depends on the degree of prematurity and the need for intervention from the NICU resuscitation team. If the baby is vigorous (and usually, near term) I will manage the situation as though the baby is at term. If the baby needs immediate resuscitation, then cord clamping must be done immediately.”

In terms of reasons for clamping the cord of preterm neonates early we found that 40% routinely clamp the cord early (i.e. within five seconds), 36% of maternity care providers clamp immediately if the infant requires resuscitation or other medical interventions, 25% clamp early to prevent maternal blood loss, 23.5% clamp immediately when umbilical stem cells need to be collected and 5% clamp early because the infant is delivered via C-section. When asked under which circumstance respondents would delay clamping the umbilical cord of a preterm infant, the most frequently cited response was personal routine (39%) followed by parental request (36%) and other (23%). The most prevalent benefits associated with delayed clamping in preterm infants were increased iron stores (41%), reduced risk of anemia (36%), less need for neonatal transfusions (26%) and increased blood flow to vital organs (24%). Common perceived disadvantages of delayed clamping were delays in resuscitation (30%), increased risk of developing jaundice (25%) and increased risk of polycythemia (21%).

Nine percent of respondents reported that they changed their cord clamping (either term or preterm) practices in the past 12 months.

DISCUSSION

The finding that umbilical cord clamping practices varied among provider groups is congruent with another study of Canadian care providers that showed significant interprofessional variation in the timing of cord clamping.⁸ Our survey was administered two years after the publication of a meta-analysis that highlighted the benefits of delayed cord clamping (>30 seconds) for preterm infants. Nevertheless our findings suggest that most care providers we surveyed did not practice delayed cord clamping with preterm neonates. Midwives were more likely to report delayed cord clamping, regardless of the infants gestational age. These differences in cord clamping practices may be a result of different approaches to managing

the third state of labour, with physicians adhering to SOGC guidelines that recommended (at the time of the study) early clamping as part of active management and midwives prescribing to expectant management.⁹

We found that cord clamping practices appear to be dominated to a large degree by personal preferences and hospital routines. A common reason for clamping the cord early when delivering term or preterm infants was the need for resuscitation of the infant or other medical interventions. Delay in resuscitation was viewed as a disadvantage of delayed cord clamping by 1 in 3 care providers. In another study, CNMs reported difficulties with practicing delayed cord clamping in hospital environments, particularly for distressed infants. Findings from our study and that of other surveys of cord clamping practices indicate that there is little support for delayed clamping of distressed infants in the hospital setting.⁶

The finding that delayed clamping is viewed as difficult to implement in clinical practice is congruent with results reported by Ononeze & Hutchon.⁷ However, they provide an example of an obstetric unit where delayed clamping of distressed infants is routinely and successfully practiced demonstrating that delayed clamping is feasible in clinical practice; e.g. newborns can be resuscitated at the perineum. The best approach to timing of cord clamping for this sub-group of infants who require resuscitation deserves further research, as it is unclear whether benefits of placental transfusion including increased circulating blood volume could outweigh those of immediate resuscitation which has traditionally included immediate clamping and cutting of the cord.

With preterm infants, 25% of care providers cited the prevention of maternal blood loss as a reason for immediate clamping. These findings are congruent with recommendation at the time about how to manage the third stage of labour, but do not take into account the evidence available at the time from a Cochrane review that recommended delaying cord clamping for 30 seconds to decrease need for blood transfusion, and prevent intraventricular haemorrhage. Survey responses highlighted a general lack of knowledge of the benefits of delayed cord clamping.

Limitations

The response rate for this survey was relatively low, especially for physicians. We did not have access to a directory of family physicians that provide intrapartum services, which made it difficult to distribute the online survey to this group of maternity care providers. Difficulties in recruiting family physicians to participate in surveys of obstetric practices and attitudes have been reported by other Canadian researchers.¹⁰ Midwives were over-represented in the current study however we have provided our findings by practitioner subgroup. Actual cord clamping practices may vary from self-reported practices, which highlights the bias inherent in self-reporting of obstetric practices. This study reports on data collected in 2006-7. It would be important to replicate this study, to see whether cord clamping practices and beliefs have changed since new evidence that supports the benefits of delayed cord clamping has been published.

CONCLUSIONS

As recently as 2007 the majority of Canadian maternity care providers including midwives, obstetricians, and family physicians self-reported clamping the umbilical cord within one minute of birth for term infants and obstetricians and family practitioners within 30 seconds for preterm infants. Our findings suggest that at a time when evidence based recommendations supported delaying umbilical cord clamping for preterm infants, practitioners were reluctant to practice delayed cord clamping despite the benefits of this simple clinical practice. It may be helpful if Clinical Practice Guidelines were developed that specifically recommend optimal timing of umbilical cord clamping. Additional research is warranted on best timing of cord clamping among infants requiring resuscitation.

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AUTHOR BIOGRAPHIES

Kathrin Stoll, MA, PhD is Research Associate in the Division of Midwifery, Faculty of Medicine, at the University of British Columbia.

Eileen Hutton, PhD, MSc, BSc is the Director of the Midwifery Education Program and Associate Professor in the Department of Obstetrics and Gynecology at McMaster University in Hamilton, Ontario. Hutton also serves as Assistant Dean, Faculty of Health Sciences and an Associate Member of the Department of Clinical Epidemiology & Biostatistics.