

# Policies for manual removal of placenta at vaginal delivery: variations in timing within Europe

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The length of the third stage of labour is a potential modifiable risk factor for postpartum haemorrhage at vaginal delivery, but there is no definitive evidence that early intervention to remove the placenta manually will prevent postpartum haemorrhage. We report a wide variation between countries in Europe in policies about the timing of manual removal of placenta. Two groups of countries with clearly

divergent policies were identified. A randomised controlled trial is needed to provide definitive evidence on the risks and benefits of manual removal of placenta at different timings after vaginal delivery.

**Keywords** Manual removal of placenta, prevention policies, postpartum haemorrhage, third stage of labour.

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## Introduction

Postpartum haemorrhage remains a major cause of maternal mortality and morbidity in both low- and high-income countries. In this group, and in particular in Europe, disparities between countries in maternal mortality and morbidity attributed to postpartum haemorrhage have been reported.<sup>1,2</sup>

Individual risk factors have been described, but they poorly predict the occurrence of postpartum haemorrhage.<sup>3,4</sup> Interest has focused on risk factors related to care provided as they are potentially amenable to change, with the hypothesis that variations in postpartum haemorrhage-related maternal

health indicators may be associated with variations in practice. From this perspective, international comparisons can provide valuable information and generate new hypotheses by identifying areas where policies or practices vary.

In the area of prevention of postpartum haemorrhage, a number of randomised controlled trials have concluded that active management of the third stage of labour decreases the risk of postpartum haemorrhage, although there are differences in the definition of active management and the individual components have not all been tested separately.<sup>5–7</sup> Despite this, it is now commonly recommended for prevention of postpartum haemorrhage.<sup>8,9</sup>

Conversely, the evidence about manual removal of placentas that have not delivered spontaneously is less convincing. A number of observational studies on vaginal deliveries have shown an association between the length of the third stage of labour and the incidence of postpartum haemorrhage.<sup>8–12</sup> These associations do not necessarily imply causality, and it is not known whether retained placenta is a cause of postpartum haemorrhage or whether it is only a marker of an impaired uterine contractility that will itself increase the risk of postpartum haemorrhage, or both. In addition, manual removal of placenta per se may increase the risk of postpartum haemorrhage

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compared with spontaneous placental delivery,<sup>10</sup> and this potential risk has to be balanced against the equally hypothetical risk of a prolonged third stage of labour. In consequence, there seems to be no definitive evidence as to how long clinicians should wait before manual removal of the placenta in cases where the woman is not bleeding.

In this context, the purposes of this study were to compare policies about manual removal of placenta at vaginal delivery in maternity units of different European countries and to compare these policies with the available evidence. These analyses were designed to complement those in an earlier article about policies for management of the third stage of labour and the immediate management of postpartum haemorrhage.<sup>11</sup>

## Methods

This article is based on data collected as part of the EUPHRATES project (European Project on Obstetric Haemorrhage, Reduction, Attitudes, Trial and Early Warning System), a European collaboration involving 14 countries: Austria, Belgium, Denmark, Finland, France, Hungary, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Switzerland and the UK.

The overall focus of this project was on prevention and management of postpartum haemorrhage. One of its components was a survey undertaken to describe current policies for management of the third stage of labour and the immediate management of postpartum haemorrhage in the maternity units of the 14 countries. The method has been fully described elsewhere.<sup>11</sup> The survey covered all maternity units in most participating countries, except for Spain where it was undertaken in Catalonia, Portugal where only public units were surveyed and France where a sample of six regions was

included. A postal questionnaire was sent to each unit in 2003, addressed to the midwife or obstetrician with overall management responsibility. The number of questionnaires sent out ranged from 29 in Denmark to 719 in Italy. Table 1 shows the exact number of questionnaires sent in each country. Respondents were asked whether they undertook specific procedures usually, sometimes, rarely or never.

The main results of the EUPHRATES survey about policies on the management of the third stage of labour have already been published elsewhere.<sup>13</sup> This article describes the replies to three questions about policies for manual removal of the placenta at vaginal delivery in the absence of abnormal bleeding. The questionnaire first asked whether the unit had a policy on how long to wait before undertaking manual removal of the placenta at vaginal delivery in the absence of abnormal bleeding. If the answer was yes, two further questions were asked about policies about the length of time after delivery when this would be performed in women who did and did not already have an epidural. Since analgesia/anaesthesia is required to perform manual removal of placenta, the presence of an epidural may facilitate an early decision to manually remove the placenta. Maternity units may have had different policies for manual removal of the placenta (MRP) depending on whether the woman already had an epidural.

The distributions of the answers to these questions for each country were described and compared. Associations between these policies and policies about early administration of oxytocics were then examined at the unit level. For this analysis, lengths of time before manual removal were subdivided into 30 minutes and less and more than 30 minutes. Units that had a policy of usually administering oxytocics prophylactically at the delivery of the anterior shoulder or immediately after birth were compared with those that did not.

**Table 1.** Samples and response rates

Country	Maternity units sampled	Number of units surveyed	Number of questionnaires received	Response rate (%)
Austria	All	104	33	31.7
Belgium	All	129	105	81.4
Denmark	All	29	23	79.3
Finland	All	33	33	100.0
France	Six regions	132	109	82.6
Hungary	All	98	98	100.0
Ireland	All	22	22	100.0
Italy	All	719	215	29.9
The Netherlands	All	99	91	91.9
Norway	All	55	46	83.6
Portugal	All public maternity units	52	37	71.2
Spain	Catalonia	62	53	85.5
Switzerland	All	130	68	52.3
UK	All	354	242	68.4

The data were analysed using STATA version SE 9 for Windows (Stata Corporation, College Station, TX, USA).

## Results

Table 1 shows the response rate for each country. Response rates varied from 30% in Italy and Austria to 100% in Finland, Hungary and Ireland, and were above 65% in 11 of 14 countries.

### Policy about manual removal of the placenta

In all countries, the majority of units had a policy about how long to wait before undertaking manual removal of the placenta at vaginal delivery in the absence of abnormal bleeding. This proportion varied from 63% of units in UK to 100% in Denmark and Norway, and was greater than 87% in 10 of 14 countries (Table 2).

### Length of time before manual removal

Policies for the timing of manual removal of the placenta varied widely between countries. The majority of respondents and their policies showed marked digit preference, and answers were given in terms of round numbers of minutes. The proportion of units with policies of waiting less than 30 minutes, usually 20 minutes, if the woman had an epidural, varied from none in Denmark, Finland and Norway, to 54% in Spain. The proportion of units with policies of waiting at least 60 minutes varied from none in Spain and Portugal to 94% in the Netherlands (Table 2; Figure 1).

Most countries had a dominant policy, reported by a vast majority of the units.

In the Netherlands, Denmark, Finland and Norway, more than 80% of the units reported a policy of waiting 60 minutes or more after delivery before manually removing the placenta, in cases where the woman had an epidural. In Spain, Belgium, France, Hungary and Portugal, 70% or more of the units had policies of waiting 30 minutes or less before manually removing the placenta in cases where the woman had an epidural. In this group of countries, the median recommended time for manual removal was 30 minutes, except for Spain where the median recommended time was 20 minutes. In the remaining countries, UK, Ireland, Switzerland, Austria and Italy, there was much less sign of a national consensus.

Policies were not very different for women who already had epidural analgesia, although there was a tendency for the time to be slightly longer for women without an epidural.

### Association with policy of early administration of uterotonics

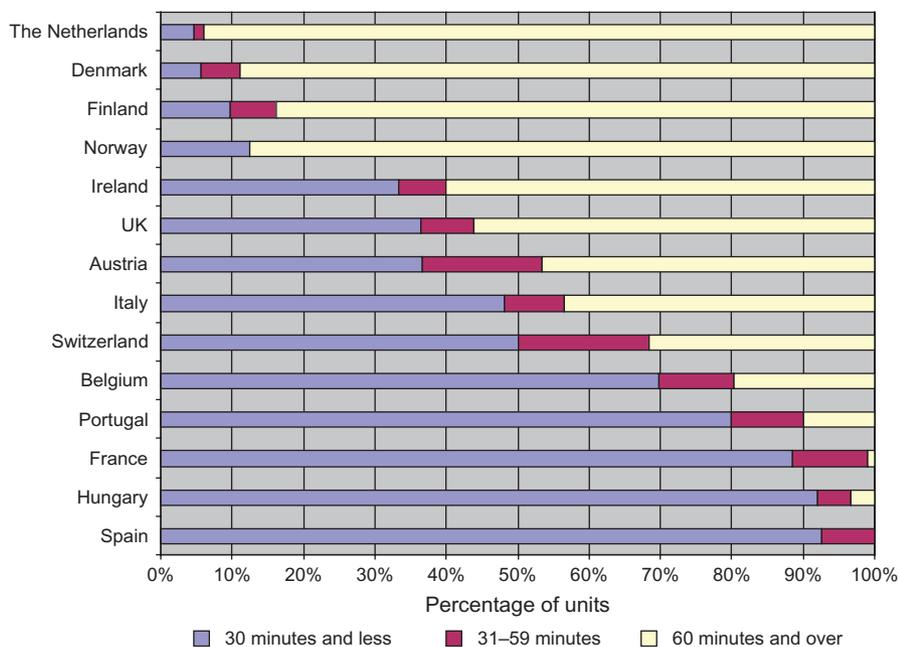
In units with a policy of early prophylactic administration of uterotonics, 53% had a policy of waiting more than 30 minutes before manual removal of the placenta, compared with 37% of other units ( $\chi^2 = 12.7$ ,  $P < 0.001$ ).

## Discussion

This study shows that policies about manual removal of placenta at vaginal delivery varied widely between countries of

**Table 2.** Policies about timing of manual removal of the placenta at vaginal delivery, in the absence of abnormal bleeding

Country	Total number of participating units	Percentage having a policy	Length of wait, with epidural, in minutes (percentage of units that had a policy)				Length of wait, without epidural, in minutes (percentage of units which had a policy)			
			Less than 30	30	31–59	60 and over	Less 30	30	31–59	60 and over
Austria	33	97.0	10.0	26.7	16.7	46.6	7.7	30.7	15.4	46.2
Belgium	105	87.6	33.7	36.0	10.5	19.8	17.4	33.7	19.8	29.1
Denmark	23	100.0	0.0	5.6	5.6	88.9	0.0	5.3	15.8	78.9
Finland	33	93.9	0.0	9.7	6.4	83.9	0.0	9.7	6.4	83.9
France	109	88.9	30.5	57.9	10.5	1.1	20.4	70.5	6.8	2.3
Hungary	98	88.8	30.7	61.3	4.8	3.2	31.5	64.4	2.7	1.4
Ireland	22	72.7	20.0	13.3	6.7	60.0	6.2	6.2	6.2	81.2
Italy	215	94.9	16.0	32.1	8.5	43.4	7.4	33.0	13.3	46.3
The Netherlands	91	96.7	1.2	3.6	1.2	94.0	1.2	1.2	2.3	95.3
Norway	46	100.0	0.0	12.5	0.0	87.5	0.0	9.1	0.0	90.9
Portugal	37	78.4	10.0	70.0	10.0	10.0	3.6	60.7	21.4	14.3
Spain	53	77.4	53.7	39.0	7.3	0.0	32.3	54.8	9.7	3.2
Switzerland	68	91.2	10.0	40.0	18.3	31.7	5.6	35.2	25.9	33.3
UK	242	63.1	5.8	30.6	7.4	56.2	3.1	27.6	8.7	60.6



**Figure 1.** Distribution of units by policy of length of wait before manual removal of placenta at vaginal delivery with epidural.

Europe, but that there was consensus within many but not all countries.

Two groups of countries with clearly contrasting policies can be distinguished. In the Netherlands, Denmark, Finland and Norway, a great majority of units had a policy of waiting 60 minutes or more before manually removing the placenta. On the other hand, in Spain, Belgium, France, Hungary and Portugal, the usual policy was to perform manual removal of the placenta in the first 30 minutes after delivery. This divergence in national policies illustrates how international comparisons can highlight areas where differences in clinical practice are a reflection of gaps in knowledge and ambiguities in the available evidence.

The spontaneous length of the third stage of labour after vaginal delivery has been described in four studies, mostly based on deliveries that occurred in the 1980s and 1990s.<sup>12–15</sup> These studies reported a median duration of between 5 and 7 minutes with between 3 and 8% of women having third stages longer than 30 minutes. This spontaneous length varies with gestational age at delivery, preterm birth being associated with longer third stages.<sup>12,13</sup> Randomised trials of active management of the third stage of labour have shown that it can significantly shorten it.<sup>5,6</sup> Shorter median durations of the third stage, down to 4 minutes, have been reported in the most recent studies.<sup>16</sup> These could be explained by an increased use of active management.

It is unclear how these factors should be taken into account in the definition of a retained placenta. According to the World Health Organization definition, retained placenta is

a third stage labour longer than 30 minutes.<sup>7</sup> A number of observational studies have found that longer third stages have been associated with a higher risk of postpartum haemorrhage.<sup>12–15</sup> One reported a higher incidence of postpartum haemorrhage with third stages longer than 30 minutes compared with 30 minutes or less but no significant association with the length of the third stage for durations shorter than 30 minutes.<sup>12</sup> In a population-based study from the Netherlands, a third stage longer than 30 minutes was associated with a 2.6 times higher rate of postpartum haemorrhage, defined as an estimated blood loss of 500 ml or more, and a 4.9 times higher rate of severe postpartum haemorrhage, defined as an estimated blood loss of 1000 ml or more, after adjustment for other risk factors compared with a third stage of 30 minutes or less.<sup>14</sup> A more recent study from a single centre where all women were actively managed reported a significantly higher rate of postpartum haemorrhage, which is defined as a measured blood loss greater than 1000 ml, for shorter durations of third stage of labour.<sup>15</sup> Third stages longer than 10 minutes were associated with a two times higher rate of postpartum haemorrhage, and those that were longer than 20 minutes with a four times higher rate, compared with rates for third stages of 10 minutes or less.

We suggest that these findings have been interpreted differently by maternity units in Europe and that the definition of retained placenta varies among European countries.

In some countries, it is likely that the reported association of an increased risk of postpartum haemorrhage with a longer third stage has led to a policy of manual extraction of

placentas that have not been expelled within 30 minutes after delivery. Such an association does not imply causality, however, and there is no evidence that artificial reduction of the length of third stage by manually removing placentas that have not been spontaneously expelled will reduce the risk of postpartum haemorrhage. Retained placenta may be the consequence of an impaired uterine contractility that will also lead to postpartum haemorrhage. In this hypothesis, a long third stage would be more a risk marker than a cause of postpartum haemorrhage. These questions can only be answered by performing a randomised controlled trial testing the impact of manual removal of the placenta at different timings after vaginal delivery. Such a trial should include a stratification and a subgroup analysis by gestational age. It is likely that the current lack of evidence for a beneficial effect of early manual removal of the placenta has led to the common policy of waiting 60 minutes or more in other countries.

It is possible that manual removal of the placenta may actually increase the risk of postpartum haemorrhage. A systematic review of randomised controlled trials has shown that, compared with spontaneous separation and controlled cord traction, manual removal of placenta at caesarean delivery is associated with a clinically important and statistically significant higher level of maternal blood loss.<sup>10</sup> Although these results cannot be directly extrapolated to vaginal delivery, in particular because the actual timing of manual removal of placenta greatly differs between the two routes of delivery, they suggest that further research is needed to determine whether manual removal of placenta is also associated with a higher level of blood loss after vaginal delivery.

Manual removal of the placenta may also increase the risk of infection in the uterus. An increased incidence of endometritis after manual removal of placenta at caesarean delivery, as compared to cord traction, has been observed in a number of randomised controlled trials.<sup>17</sup>

It is unclear whether this is true for vaginal delivery as the evidence from observational studies is heterogeneous, however.<sup>18</sup> In the current context of ambivalent evidence about risks and benefits of manual removal of placenta at vaginal delivery, national policies appear to be in accordance with other choices made for the management of delivery in general. Northern European countries are more in favour of a noninvasive approach, while obstetric intervention forms a larger role in standard care in Central and Southern Europe. These contrasting policies may also result from practical considerations that make it more or less easy to wait for placenta separation. For example, there may be time constraints on the occupation of the delivery room or on midwifery time, or decisions may be influenced by the active presence of an obstetrician in the delivery room.

Interestingly, this survey showed that maternity units with a policy of usually administering oxytocics prophylactically at the delivery of the anterior shoulder or immediately after

birth were more likely to recommend a longer length of time before manual removal of the placenta. On the one hand, this may appear surprising as preventive uterotonics have been shown to shorten the third stage of labour.<sup>19</sup> On the other hand, this result may reflect differences in the strategies for the prevention of postpartum haemorrhage at vaginal delivery, with some units performing more invasive interventions such as manual removal of the placenta, while others opt for less invasive management such as uterotonics.

### Limitations

This survey was conducted in 2003. It is possible that maternity units' policies about manual removal of the placenta have changed since then and that the results given here do not reflect their current policies. Since no major new results have been published on the topic in the meantime, such a change seems unlikely, however. In addition, this survey did not attempt to collect data about actual clinical practice.

Although the EUPHRATES survey attempted to collect data about outcomes in terms of postpartum haemorrhage rates, the data were incomplete and were of poor quality. In an attempt to see if incidence rates of postpartum haemorrhage reflect differences in national policies, we looked at the correlation between the proportion of units waiting 60 minutes or more before performing manual removal of the placenta from this survey and the incidence of severe postpartum haemorrhage reported in the MOMS-B study (MOMs' Mortality and Morbidity Study) conducted in the late 1990s<sup>1</sup> for the nine countries included in the two studies. No significant association was found, but the number of countries was limited, and the geographical areas did not match exactly as many of the data in MOMS-B relate to regions rather than to whole countries.

### Conclusions

The length of the third stage of labour constitutes a potential modifiable risk factor for postpartum haemorrhage at vaginal delivery, but evidence about the optimal lag time to manual removal of placenta is ambivalent. The marked differences observed between the 14 participating European countries in policies about manual removal of placenta may reflect differences in the interpretation of this available evidence. A randomised controlled trial is needed to provide definitive evidence on the risks and benefits of manual removal of the placenta at different timings after vaginal delivery.

### Contribution to authorship

C.D.-T. participated in the design of the survey and the questionnaire, the implementation of the survey in her country, the analysis of the data, undertook the drafting and revision of the paper and has seen and approved the final version of the article.

A.M. participated in the design of the survey and the questionnaire, the implementation of the survey in her country, undertook the

cleaning and analysis of the data, participated in the revision of the draft paper and has seen and approved the final version of the article. C.W. participated in the design of the survey and the questionnaire, the implementation of the survey in her country, the cleaning and analysis of the data and the revision of the draft paper and has seen and approved the final version of the article.

W.-H.Z. participated in the design of the survey and the questionnaire, the implementation of the survey in her country and the revision of the draft paper and has seen and approved the final version of the article.

S.A. initiated the collaborative project; participated in the design of the survey and the questionnaire, the implementation of the survey in her country and the revision of the draft paper and has seen and approved the final version of the article.

M.-H.B.-C. participated in the design of the survey and the questionnaire, the implementation of the survey in her country and the revision of the draft paper, and has seen and approved the final version of the article.

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## References

- Zhang WH, Alexander S, Bouvier-Colle MH, Macfarlane A. Incidence of severe pre-eclampsia, postpartum haemorrhage and sepsis as a surrogate marker for severe maternal morbidity in a European population-based study: the MOMS-B survey. *BJOG* 2005;112:89–96.
- Salanave B, Bouvier-Colle MH, Varnoux N, Alexander S, Macfarlane A. Classification differences and maternal mortality: a European study. MOMS Group. MOthers' Mortality and Severe morbidity. *Int J Epidemiol* 1999;28:64–9.
- Sherman SJ, Greenspoon JS, Nelson JM, Paul RH. Identifying the obstetric patient at high risk of multiple-unit blood transfusions. *J Reprod Med* 1992;37:649–52.
- Mathai M, Gulmezoglu AM, Hill S. Saving women's lives: evidence-based recommendations for the prevention of postpartum haemorrhage. *Bull World Health Organ* 2007;85:322–3.
- Prendiville WJ, Harding JE, Elbourne DR, Stirrat GM. The Bristol third stage trial: active versus physiological management of third stage of labour. *BMJ* 1988;297:1295–300.
- Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingsbrooke randomised controlled trial. *Lancet* 1998;351:693–9.
- Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. *Cochrane Database Syst Rev* 2000;CD000007.
- International Confederation of Midwives, International Federation of Gynecologists and Obstetricians. Joint statement: management of the third stage of labour to prevent post-partum haemorrhage. *J Midwifery Womens Health* 2004;49:76–7.
- World Health Organization. *Managing Complications in Pregnancy and Childbirth*. Geneva, Switzerland: World Health Organization, 2000 [www.who.int/making\_pregnancy\_safer/publications/archived\_publications/mcpcpdf]. Accessed 30 June 2008.
- Wilkinson C, Enkin MW. Manual removal of placenta at caesarean section. *Cochrane Database Syst Rev* 2000;CD000130.
- Winter C, Macfarlane A, Deneux-Tharoux C, Zhang WH, Alexander S, Brocklehurst P, *et al.* Variations in policies for management of the third stage of labour and the immediate management of postpartum haemorrhage in Europe. *BJOG* 2007;114:845–54.
- Combs CA, Laros RK Jr. Prolonged third stage of labor: morbidity and risk factors. *Obstet Gynecol* 1991;77:863–7.
- Dombrowski MP, Bottoms SF, Saleh AA, Hurd WW, Romero R. Third stage of labor: analysis of duration and clinical practice. *Am J Obstet Gynecol* 1995;172:1279–84.
- Bais JM, Eskes M, Pel M, Bonsel GJ, Bleker OP. Postpartum haemorrhage in nulliparous women: incidence and risk factors in low and high risk women. A Dutch population-based cohort study on standard (> or = 500 ml) and severe (> or = 1000 ml) postpartum haemorrhage. *Eur J Obstet Gynecol Reprod Biol* 2004;115:166–72.
- Magann EF, Evans S, Chauhan SP, Lanneau G, Fisk AD, Morrison JC. The length of the third stage of labor and the risk of postpartum hemorrhage. *Obstet Gynecol* 2005;105:290–3.
- Magann EF, Doherty DA, Briery CM, Niederhauser A, Morrison JC. Timing of placental delivery to prevent post-partum haemorrhage: lessons learned from an abandoned randomised clinical trial. *Aust N Z J Obstet Gynaecol* 2006;46:549–51.
- Anorlu RI, Maholwana B, Hofmeyr GJ. Methods of delivering the placenta at caesarean section. *Cochrane Database Syst Rev* 2008; CD004737.
- Chongsomchai C, Lumbiganon P, Laopaiboon M. Prophylactic antibiotics for manual removal of retained placenta in vaginal birth. *Cochrane Database Syst Rev* 2006;CD004904.
- Elbourne DR, Prendiville WJ, Carroli G, Wood J, McDonald S. Prophylactic use of oxytocin in the third stage of labour. *Cochrane Database Syst Rev* 2001;CD001808.