

# An Education and Motivation Intervention to Change Clinical Management of the Third Stage of Labor —The GIRMMAHP Initiative

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**ABSTRACT:** **Background:** Hemorrhage and hypertensive disorders are major contributors to death after delivery in developing countries. The GIRMMAHP Initiative was designed to describe the actual delivery care in five Latin American countries and to educate and motivate clinical staff at 17 hospitals with the purpose of implementing their own clinical practice guidelines to prevent postpartum hemorrhage. **Methods:** A multicountry education intervention was developed in four consecutive stages, using two analyses: (a) an observational study of the clinical records in eight teaching and nine nonteaching hospitals and (b) a study of the long-term changes measured 12 months after completion of an education intervention and writing a local clinical guideline. **Results:** Data from 2,247 pregnant women showed that only 23.3 percent had an active management of the third stage of labor and that 22.7 percent received no prenatal care visit. These data were used to prepare local clinical practice guidelines in each participant hospital. The proportion of active management increased to 72.6 percent of deliveries at 3 months and 58.7 percent 1 year later. Use of oxytocin during the third stage of labor increased to 85.9 percent of included deliveries. The proportion of women who had postpartum hemorrhage decreased from 12.7 percent at baseline to 5 percent at 1 year after the intervention. **Conclusions:** An education intervention and discussion of actual clinical practice problems with health professionals and their involvement in drafting clinical guidelines helped improve health care quality and practitioners' adherence to these guidelines. (BIRTH 35:4 December 2008)

**Key words:** postpartum hemorrhage, clinical guidelines, education intervention, drug use, Latin America

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The reduction of maternal mortality is one of the United Nations' Millennium Development Goals; a reduction by three-quarters between 1990 and 2015 is expected (1). Hemorrhage and hypertensive disorders are major contributors to death after delivery in developing countries (2). With respect to the management of postpartum hemorrhage, interventions such as active management of the third stage of labor, consisting of controlled cord traction, early cord clamping, and administration of prophylactic oxytocic agents, are beneficial, compared with expectant management; evidence shows that controlled cord traction alone may be beneficial and uterine massage has unknown effectiveness (3).

Two of these active management interventions are simple, and the skills to perform them can be easily acquired with clinical training. The parenteral administration of oxytocin, although it is not an expensive intervention, requires skilled personnel and the paraphernalia to administer drugs by this route. The World Health Organization supports the active management strategy (4), which the health authorities of most countries recommend in their clinical practice guidelines. Nevertheless, examples are reported of poor adherence to clinical guidelines or to the published clinical evidence, such as the continued use of ergometrine in tropical climates or reduced active management practices (5,6). A recent systematic review of 34 data sets including more than 35,000 maternal deaths highlighted the means to avoid deaths by, first, the need to increase emphasis on prevention and treatment programs of postpartum hemorrhage through appropriate diagnosis and management, and second, the need to apply stronger efforts to improve the quality of recording and reporting data on labor and its complications (2). Education programs and governmental support have been claimed as decisive factors to reduce maternal mortality (7), and active involvement of health professionals has been shown to be among the essential keys to attain high adherence rates to clinical practice guidelines (8).

The GIRMMAHP Initiative (the Catalan acronym for International Group for the Reduction of Morbidity and Mortality Associated with Postpartum Haemorrhage) began in September 2003 with three main objectives: first, to develop a training intervention to improve care during delivery and to adopt clinical guidelines with an emphasis on prevention of postpartum hemorrhage in selected hospitals of five Latin American countries; second, to validate the strategy for future dissemination of the strategy within each participant country; and third, to create a network of health professionals involved in maternity care in the participant countries (please see additional details at: <http://www.girmmahp.net>).

The aim of this paper was to summarize the main results of the GIRMMAHP Initiative by means of a descriptive study of delivery care in 17 Latin American hospitals and the long-term effects of an intervention aimed at adapting evidence-based clinical guidelines through active participation and involvement of the health professionals who would use them, in the first seven hospitals that completed 1 year of follow-up.

## Methods

The GIRMMAHP Initiative was a multicountry educative intervention developed in four consecutive stages (Table 1). The initiative began in teaching hospitals of Nicaragua, Peru, and the Dominican Republic; later, hospitals from Argentina and Guatemala were also included, and the experience was replicated in nonteaching provincial hospitals of these countries.

This paper presents an overview of the management of labor in the 17 included hospitals obtained from the analysis of stage 1 of the GIRMMAHP Initiative (2003–2005). This information is followed with the analysis of the short- and long-term impact of the intervention in the first seven teaching hospitals involved since September 2003.

### *Participant Hospitals*

Up to 17 hospitals were included in the GIRMMAHP Initiative. Between September 2003 and September 2004, seven teaching hospitals were selected: Bertha Calderón Roque and Fernando Vélez Paíz (Managua, Nicaragua); José Ramon Vidal (Corrientes, Argentina); Instituto Materno Perinatal and San Barloomé (Lima, Peru); and Los Minas and La Mujer Dominicana (Santo Domingo, Dominican Republic). One year later, eight provincial nonteaching hospitals were added: Humberto Alvarado and Amistad Japón-Nicaragua (Masaya and Granada, respectively, Nicaragua); Ángela Iglesia de Llano and Goya (Corrientes and Goya, respectively, Argentina); El Carmen de Huancaayo and Departamental de Cusco (Junín and Cusco, respectively, Peru); and JM Cabral y Báez and Fabio Mota (Barahona and Santiago de los Caballeros, respectively, Dominican Republic). Finally, a teaching hospital (Roosevelt) and a provincial hospital (Chimaltenango) from Guatemala were included in May 2005.

### *Study Intervention*

The philosophy behind the GIRMMAHP Initiative consisted of showing a picture of the actual

management of delivery to the involved staff of each hospital so as to identify inappropriate practices (stage 1). The results of this observational study were discussed within each group with the objective of trying to improve the situation. Next, a clinical practice guideline for each center was written or adapted during a 3-month-long education workshop (stage 2). In a follow-up period, two additional observational studies (stages 3 and 4) were carried out after the intervention.

The education intervention to develop local clinical practice guidelines (stage 2) was based on active participation of the health professionals working in the obstetrics ward of each participant hospital (i.e., physicians, residents, midwives, and nurses). The actual practice observed in each hospital during stage 1 was compared with the evidence-based recommendations for the Latin American and the Caribbean Region issued by the World Health Organization/*Pan American Health Organization* (WHO/PAHO) (4), and also the Cochrane Library reviews (9). This process was followed by several workshops conducted by the GIRMMAHP coordinator and the country monitors in each participant hospital, a process that lasted up to 3 months.

The theoretical content of the workshops included the following topics: scientific information, evidence-based medicine, and rational drug use principles, and theory about clinical practice guidelines and how to write and implement them. Almost all clinicians in the obstetrics wards took part in these workshops. The practice part of the workshops consisted of writing and adapting a clinical practice guideline for the prevention of postpartum hemorrhage, the central recommendation of which was active management.

A group of four to six practitioners (mostly physicians, but at least one midwife and one nurse) drafted a first version of the clinical practice guideline, which was subsequently discussed with the group to obtain the final draft. Once drafted and printed, all group members had paper copies of the new guideline. The clinical guideline and the whole GIRMMAHP experience was promoted throughout the hospital, and posters encouraging adherence to the guideline were present in emergency rooms. In addition, the new clinical guideline was included as a part of the teaching plan of each hospital.

Three and 12 months later, additional observational studies were carried out with the aim of measuring the adherence to the clinical practice guidelines recommendations (stages 3 and 4, respectively). Each of these stages was followed by a presentation of the results to the clinical staff and a reminder of the clinical practice guidelines content.

### Study Samples

During the study period (30 days in stages 1 and 4 and 14 days in stage 3), the clinical records, including medication and nursery sheets and the specific Centro Latinoamericano de Perinatología y Desarrollo Humano (CLAP) data sheet, were reviewed. The CLAP data sheet is a perinatal information system issued by the Latin American Center for Perinatology and Human Development supported by WHO/PAHO, in which the health practitioners supply detailed information about the pregnancy, delivery, and postpartum period (10). The CLAP data sheet is used in many Latin American hospitals; in addition to many variables described below, it contains the

**Table 1. The Four Consecutive Stages of the GIRMMAHP Initiative (<http://www.girmmahp.net>)**

Stage	Objectives	Duration (Months)	Accumulated Time (Months)
1	Observational study to characterize delivery care	1 each hospital	1
2	Intervention To discuss the results of the observational study To compare evidence-based CPGs with current practice To stimulate the demand for CPGs Knowledge transference process including topics such as evidence-based medicine and theory about CPGs Workshop to adapt a CPG for the obstetrics department of each participant hospital	3	4
3	Short-term postintervention observational study 3 mo after the implementation of the CPGs	0.5 each hospital	7.5
4	Long-term postintervention observational study 12 mo after the implementation of the CPGs	1 each hospital	17

CPGs = clinical practice guidelines.

three variables to define active management (controlled cord traction, early cord clamping, and oxytocin use).

### Variables

In each observational study, data were collected on age; prenatal care visits; risk factors for postpartum hemorrhage during pregnancy; risk factors for postpartum hemorrhage during labor; pharmacological and nonpharmacological measures during labor; immediate cord clamping, cutting, and drainage (yes/no); controlled cord traction (yes/no); uterine massage (yes/no); and use of an oxytocic agent. If postpartum hemorrhage was diagnosed, information on its causes, management, and clinical outcome was also collected.

### Logistics

In each participant country, a monitor with background in pharmacoepidemiology coordinated the GIRMMAHP Initiative at the local level. The whole project was coordinated at the Foundation Institut Català de Farmacologia in Barcelona, Spain. After an initial discussion of the main objectives and chronological schedule held in Lima in September 2003, the process was followed up using the Internet, which enabled a permanent connection, despite the long distances (11).

### Statistical Analysis

The purpose of studying the actual management of labor in each center was to highlight inappropriate practices to stimulate the discussion of participants and to follow-up the potential effects of these discussions. Thus, the studies carried out during stages 1, 3, and 4 had an observational design. For continuous variables (e.g., age or number of prenatal visits), descriptive statistics were used. The differences between teaching and provincial hospitals (stage 1) were interpreted using the difference of proportions test. The changes between stages 1 and 3 and stages 1 and 4 were interpreted using the difference between hypothesis test and expressed by the value of  $Z^*$  and a probability that the null hypothesis was true ( $p < 0.05$ ).

## Results

### Basic Delivery Care

The analysis of the observational study of delivery care (stage 1) included data from 2,247 women who gave birth in 17 hospitals from Argentina, Dominican Republic, Guatemala, Nicaragua, and Peru. Table 2 summarizes the main variables that reflect relevant data from the obstetric and the public health point of view. The mean age of the included women was 24 years (SD 5.3 yr); a significant 10.4 percent of the population (233 women) was younger than 18 years. The mean number of prenatal visits was 4 (SD 2.6), but 22.7 percent (511) of women had not received any

**Table 2. Main Characteristics of the Baseline Observational Study of the Delivery Care in 17 Teaching and Provincial Hospitals of Argentina, Dominican Republic, Guatemala, Nicaragua, and Peru (See "Methods" Section)**

Characteristic	Teaching Hospital No. (%)	Provincial Hospital No. (%)	Total No. (%)
Total number	1,166 (100)	1,081 (100)	2,247 (100)
< 18 yr old	106 (9.1)	127 (11.7)	233 (10.4) <sup>a</sup>
"0" prenatal visits	176 (15.1)	335 (31.0)	511 (22.7) <sup>a</sup>
Anemia	234 (20.1)	158 (14.6)	392 (17.4) <sup>a</sup>
Analgesia	421 (36.1)	390 (36.1)	811 (36.1)
Antibiotics	364 (31.2)	290 (26.8)	654 (28.1) <sup>a</sup>
Oxytocin <sup>b</sup>	751 (64.4)	782 (72.3)	1,533 (68.2) <sup>a</sup>
Cord clamping	707 (60.6)	676 (62.5)	1,383 (61.5)
Controlled cord traction	436 (37.4)	400 (37.0)	836 (37.2)
Uterine massage	434 (37.2)	310 (28.7)	744 (33.1) <sup>a</sup>
"Active management" <sup>c</sup>	265 (22.7)	259 (24.0)	524 (23.3) <sup>a</sup>
PPH as diagnosed in clinical records	150 (12.9)	95 (8.8)	245 (10.9) <sup>a</sup>

<sup>a</sup> $Z^*$  value after comparing provincial versus teaching hospitals,  $p < 0.05$ ; <sup>b</sup>only oxytocin administered during the third stage of labor; <sup>c</sup>active management includes immediate cord clamping, controlled cord traction, and oxytocin.

PPH = postpartum hemorrhage.

prenatal visit before arriving at hospital for delivery. Anemia was identified as a risk factor for postpartum hemorrhage in 392 (17.4%) women. During labor, only 36.1 percent (811) of women received analgesia, according to the information included in the clinical chart, the nursery sheet, or the CLAP data sheet.

An analysis of the active management showed that 68.2 percent (1,533) of the included women received oxytocin, 61.5 percent (1,383) had the cord clamped, and 37.2 percent (836) had controlled cord traction. During that period, 245 (10.9%) women had a diagnosis of postpartum hemorrhage written in their clinical chart.

Table 2 also shows these variables disaggregated by hospital type (teaching hospital [1,166 women, 51.9% of the total sample] vs provincial nonteaching hospital [1,081 women, 48.1%]). Differences were found in the proportion of women younger than 18 years, number of women without prenatal controls, proportion of use of oxytocin during the third stage of labor, and active management (all higher in provincial hospitals), and in the diagnosis of anemia, use of antibiotics during labor, and use of uterine massage (higher in teaching hospitals).

#### *Long-Term Impact of the Education Intervention*

Table 3 compares the evolution of several variables associated with delivery care in seven teaching hospitals of Argentina, Dominican Republic, Nicaragua, and Peru from baseline (stage 1) to the postintervention periods (stage 3, 3 mo after the education intervention, and stage 4, 12 mo after the education intervention).

Stage 1 (30 days of observation) included 1,008 women, stage 3 (14 days) included data from 585 women, and stage 4 (30 days) included data from 797 women. The comparison showed no change in variables in which the education intervention to adapt a local clinical guideline did not interfere, such as the number of pregnant women younger than 18 years giving birth at these hospitals and the number of women for whom no prenatal visit before giving birth was known (both  $ps > 0.05$ ). On the other hand, a change that could be observed at least 1 year after the education intervention was the rate of administration of oxytocin during the third stage (from 71% of the sample [716 women] at baseline to 78.1% [441 women] 3 mo after the intervention and 85.9% [685 women] 1 yr after the intervention;  $p < 0.05$  in both cases).

It should be noted that the administration of oxytocin during the third stage of labor is one of the three accepted components of active management. Similar changes were shown for the rates of immediate cord clamping (68.2%, 94.2%, and 87.5%, respectively;  $p < 0.05$ ) and the controlled cord traction (42.6%, 79.3%, and 73.0%, respectively;  $p < 0.05$ ). Thus, the rate of deliveries in which active management was present evolved from 26.3 percent to 72.6 percent and 58.7 percent ( $p < 0.05$  for both comparisons; Table 3).

At stage 1, the proportion of clinical charts that included a written diagnosis of postpartum hemorrhage was 12.7 percent of 1,008 deliveries (128 cases). During stage 3, this proportion was 6.9 percent of 565

**Table 3. Main Characteristics of the Delivery Care in Five Teaching Hospitals of Argentina, Dominican Republic, Nicaragua, and Peru, and Evolution of Several Variables from Baseline (Stage 1) to 3 Months (Stage 3) and 12 Months after the Education Intervention (Stage 4) (See "Methods" Section for Details)**

<i>Characteristic</i>	<i>Stage 1 No. (%)</i>	<i>Stage 3 No. (%)</i>	<i>Stage 4 No. (%)</i>
Total number	1,008 (100)	565 (100)	797 (100)
< 18 yr old	88 (8.7)	57 (10.1)	67 (8.4)
"0" prenatal visits	155 (15.4)	79 (14.0)	155 (19.4)
Anemia	232 (23.0)	159 (28.1)	231 (29.0)
Analgesia	421 (41.8)	226 (40.0)	334 (41.9)
Antibiotics	362 (35.9)	135 (23.9)	254 (31.9) <sup>a,b</sup>
Oxytocin <sup>c</sup>	716 (71.0)	441 (78.1)	685 (85.9) <sup>a,b</sup>
Cord clamping	687 (68.2)	532 (94.2)	697 (87.5) <sup>a,b</sup>
Controlled cord traction	429 (42.6)	448 (79.3)	582 (73.0) <sup>a,b</sup>
Uterine massage	428 (42.5)	440 (77.9)	603 (75.7) <sup>a,b</sup>
"Active management" <sup>d</sup>	265 (26.3)	410 (72.6)	468 (58.7) <sup>a,b</sup>
PPH as diagnosed in clinical records	128 (12.7)	39 (6.9)	40 (5.0) <sup>a,b</sup>

<sup>a</sup>Z\* value after comparing stage 3 versus stage 1;  $p < 0.05$ ; <sup>b</sup>Z\* value after comparing stage 4 versus stage 1;  $p < 0.05$ ; <sup>c</sup>only oxytocin administered during the third stage of labor; <sup>d</sup>active management includes immediate cord clamping, controlled cord traction, and oxytocin.

PPH = postpartum hemorrhage.

deliveries (39 cases) and decreased to 5 percent of 797 deliveries (40 cases) at stage 4. Again, the changes were significant for both comparisons ( $ps < 0.005$ ).

### Discussion

Health professionals are flooded with changing information from scientific journals, pharmaceutical industries, and clinical practice guidelines issued by health ministries and scientific institutions (12). Nevertheless, they seldom have the opportunity to take part actively in developing the practice guidelines that they will be using in their clinical work setting or to discuss their content with the authors of those guidelines. The GIRMAHP Initiative proposed such an intervention for health professionals aimed at stimulating and transferring knowledge by their active involvement in both drafting their own clinical practice guidelines and in increasing the popularity of an effective strategy to reduce postpartum hemorrhage morbidity and mortality.

The analysis of all the GIRMAHP data showed that in the 17 Latin American hospitals included in the project, some characteristics of delivery management indicated substandard care; for example, the principles of the active management strategy (controlled cord traction, immediate cord clamping, and oxytocin use) were followed in less than 25 percent of the study population. When these substandard local data were discussed with the involved health professionals of each hospital and after they actively participated in developing an evidence-based clinical practice guideline, the rate of deliveries conducted with active management significantly increased (almost 75% of women). In addition, this rate remained reasonably high (almost 60%) for at least 1 year after the education intervention.

The baseline observation carried out in 17 hospitals was useful to highlight topics related to the risk of presenting postpartum hemorrhage. Several authors have described the high number of pregnancies in teenagers (13), and it underlines the need to strengthen effective education campaigns that are both realistic in terms of the sexual activity needs of teens and attractive. Similarly, the high prevalence of anemia and lack of prenatal care are issues that should be addressed by the health authorities of each country.

The baseline observation also showed several substandard practices that were included as working topics during the elaboration of the clinical guidelines, such as the rate of oxytocin use during the third stage of labor, the low rate of immediate cord clamping and controlled cord traction, and the inexplicably low rate

of analgesia administration (36% of the observed deliveries). Some of these variables differed according to the category of the hospital (teaching vs nonteaching). Curiously, the rate of deliveries in which oxytocin and immediate cord clamping appeared in the clinical records was higher in nonteaching hospitals than in teaching hospitals.

As recognized by the directive teams of the participant hospitals, in addition to contributing to the prevention and management of postpartum hemorrhage, the GIRMAHP Initiative was useful in incorporating the concept of clinical practice guidelines in these participant hospitals. Although most hospitals have "guidelines" for several conditions, usually these recommendations are prepared in the classical way by a team of specialists motivated and organized by a health ministry department or a clinical society, and practitioners view them as impositions.

The GIRMAHP Initiative proposed a more complex process that required interventions hospital by hospital. The practitioners' dynamic participation in developing their own clinical guideline increased both their adherence to those standards and the interest by clinicians from other wards and specialties for drafting clinical practice guidelines since the whole process was presented in open hospital sessions. This approach is more expensive and requires more time than the classical way, but despite this apparent limitation, the involvement of health professionals in their decision-making process reinforces the cooperation among the professionals of a particular service (i.e., among physicians, midwives, nurses, and medical residents) and, as shown in this analysis, leads to high adherence rates, even 1 year after the intervention. In addition, the intervention included a knowledge transfer process that empowered the trained professionals to develop future clinical guidelines on their own (e.g., neonatal sepsis, preeclampsia treatment).

Postpartum hemorrhage is more frequent and severe when giving birth at home without trained personnel, in primary care facilities, or in less prepared hospitals; despite this concern, until now, the GIRMAHP Initiative had been focused in teaching level 3 hospitals first and provincial hospitals later. The reasons for making this decision were twofold: to set up progressive interventions in each country, first, beginning with the most specialized centers and the hospitals where future physicians are trained who will work in primary care centers and level 1 hospitals; and second, beginning with teaching hospitals, which will empower these health professionals for a second step at provincial hospitals and a future third step in primary care settings. These progressive interventions ideally could be conducted by facilitators who had already participated in the workshops, thus ensuring

that hospitals would not be dependent on the foreign GIRMMAHP team.

The observational studies of the GIRMMAHP Initiative were designed to obtain data from clinical records. Since it is well known that clinical records are not always complete and accurate (2), a potential bias of the results due to inaccuracies in reporting is possible. Notwithstanding this limitation, the GIRMMAHP Initiative tried to make the baseline measure of the delivery care as objective as possible, thus avoiding the presence of an "observer" in each ward who could modify the actual practices (Hawthorne effect). Furthermore, many Latin American countries use the specific and complete CLAP data sheet (10), where all needed information is routinely collected. Unfortunately, this useful tool is not always completed properly. In addition, the clinical records are legal documents, and they are the only way to know the diagnoses and the treatments received by every woman; this issue was also discussed in the workshops.

Additional limitations can be explained by low numbers. Despite the inclusion of 17 hospitals from five Latin American countries and gathering data from more than 2,000 women, the figures per hospital were relatively low, so it was difficult or impossible to carry out more specific or detailed calculations, such as differences in each hospital outcome (i.e., number of postpartum hemorrhages) according to the adherence to guideline's recommendations or differences in adherence to the clinical standards split by practitioners (physician, medical resident, midwife), age, or gender. To answer these questions, larger studies with a more specific design should be carried out.

At least one other study that involved the clinical staff in the elaboration of clinical practice guidelines for postpartum hemorrhage prevention and management showed a higher proportion of adherence to the recommendations (nearly 100%) than the GIRMMAHP result (75%) (14). The rotation of medical residents and staff (especially at teaching hospitals where the long-term impact was measured) is high, partly due to their teaching role. This observation can reduce the expected effects of education interventions and clinical practice guidelines implementation in real conditions, so this point should be considered when preparing the promotional strategy of clinical practice guidelines: periodic reminders are necessary. This fact could also explain why the rate of postpartum hemorrhage after the intervention decreased in all participating centers.

Perhaps the most appropriate way to measure the effects of active participation such as that proposed by the GIRMMAHP Initiative would be a clinical trial design in which one group of professionals received the intervention and another just received a standard

clinical guideline issued as usual by the health ministry. At least one such trial is ongoing (15), although, to our knowledge, the results have not yet been published. Conducting a trial is expensive; the present project was supported by two small grants through a public agency from Catalonia given to projects that involve education (transfer of knowledge) and not only scientific research. Therefore, to try to maximize the number of beneficiaries, a simple precomparison and postcomparison study was proposed for our study.

## Conclusions

The implementation of an education intervention with active participation of the clinical staff to develop local clinical practice guidelines for the prevention and management of postpartum hemorrhage was followed by changes in the rates of deliveries in which active management strategies were used in seven Latin American hospitals from five countries. These changes lasted for at least 1 year. Meanwhile, strategies that actively involve health professionals in making their own informed decisions could be more useful and effective than simply recommending or imposing a clinical practice guideline.

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