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Training Evaluation Report MotherCare/Bolivia

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Executive Summary

In January 1999, MotherCare conducted a final evaluation of its in-service training program in Bolivia. The in-service training program for doctors, nurses, and auxiliaries began in February 1997, and concluded in June 1998. A two-person team collected data using five instruments to assess the knowledge, skills, and attitudes of a sample of providers from six districts. Seventeen providers from the facilities in the five districts that received MotherCare's in-service training program (28% of trained providers) and 11 providers from a district (Iliampu) that had not received the in-service training were included in the evaluation. The group from Iliampu served as a comparison group for the evaluation.

This evaluation shows that the MotherCare in-service training program was able to improve the care provided to mothers and newborns by health providers. It also improved the communication between women/their families and health providers and the functioning of the medical team, within a facility and from one level to another. The training program has been less successful in improving record keeping through the use of the partograph by all health providers.

Although no difference was detected in the mean scores of the knowledge test, more confidence in skills related to newborn and postpartum care was reported by the providers who received the in-service training. Skill competency improved as demonstrated by statistically significant differences in mean scores for six content areas included in the skills assessment: prenatal care, care in labor and delivery, immediate newborn care, management of postpartum hemorrhage, interpersonal communication and counseling, and anemia treatment and control. In addition, the increased ability of the providers to describe the complicated cases they managed and the actions they took in these cases also indicates improved quality of care.

Interpersonal communication and counseling skills and skills related to the prevention and control of anemia were improved after the in-service training, as demonstrated in the skills assessment and in the providers' interviews. The strong focus on practicing communication and counseling skills in the in-service training program contributed to the improvement.

In general, the MotherCare/Bolivia in-service training program has placed special emphasis on several areas: changing the "atmosphere" in which services are provided so they are more culturally appropriate and client/family -friendly, improving provider performance in handling complications, increasing iron supplementation to reduce the prevalence of anemia; and improving teamwork among the various members and levels of care.

Despite these improvements, the generally low scores among those who received the in-service training (range from 57% to 74%) and the even lower scores among those with no in-service training (range 39% to 52%) highlight the low ability of many providers to provide appropriate care for the populations they serve. This reflects inadequacies in the basic educational programs of physicians, nurses, and auxiliaries. A four-week in-service training course cannot fill the gaps left after a two- to four-year, pre-service education program in nurse auxiliary, nursing, and medical schools. This problem is compounded by the high turnover rate among providers. The staffing of physicians and some nurses in health centers, particularly in rural areas, relies on the one-year posting of new medical and nursing school graduates to these sites. This contributes to the constant turnover in staff. These two issues highlight the inadequacy of relying on in-service training to address the knowledge and skill deficits among providers. These problems are being addressed among the physicians with the inclusion of a curriculum in the medical schools of two universities, but the problem still needs to be more universally addressed, especially for nurses and auxiliaries.

Once new skills are acquired, whether as a new graduate or following an in-service training program, interventions that include supervision and continuing education at local levels are needed to strengthen and maintain skills. This need is demonstrated by the continuing low levels of use of the partograph to monitor labor, despite its inclusions in the in-service training. Providers report that the partographs are not generally available and hence rarely used. This highlights the need for support from all levels, beyond inclusion in in-service training, to implement policies.

The evaluation was able to identify areas where the MotherCare in-service training program significantly improved care and areas where deficits remain. In addition, it was also able to identify the necessary areas where providers seem to already have knowledge and skills. The results of this evaluation should be useful to the MSPS and JHPIEGO's Maternal and Neonatal Health Program as they plan for continuing activities in Bolivia. The tools used in the evaluation are also suited for providing baseline data in any new areas, and if desired, continued assessment of the obstetrical and neonatal skills of general doctors.

Introduction

MotherCare/Bolivia (MC/Bolivia), in collaboration with the Ministry of Health (MSPS) in Bolivia, identified two important factors as contributing to the high maternal and perinatal mortality rates in Bolivia: poor utilization of health services and poor quality of health services. Use of health services by the women in the five MotherCare districts is low, with approximately 55 percent of the women accessing antenatal care and less than 50 percent of the deliveries occurring in health facilities. From qualitative research conducted by MC/Bolivia, women reported some of the reasons for not using services:

- a feeling of being treated rudely and being discriminated against
- cultural beliefs not respected
- not afforded privacy
- cold rooms
- constant turnover of physicians and nurses at health centers and hospitals

An in-service training needs assessment among providers, conducted by MC/Bolivia, revealed gaps in what is considered basic maternal and newborn care skills and providers' confidence levels in providing services. Almost all providers reported that they have not had in-service training or requested more in-service training for such basic activities as use of the prenatal record card, vaginal exams, monitoring labor, and patient counseling.

To address some of these deficiencies, MC/Bolivia technical staff and consultants and the MSPS developed protocols for maternal and newborn care for health care providers at first and second levels of care—health posts, health centers, and district hospitals. These protocols include medical management and specific messages for health care providers for 52 maternal and newborn complications. In the process of defining the protocols, a lack of understanding of the roles and responsibilities that health care providers at lower levels face was identified as a problem. These protocols formed the basis for the development of a competency-based, in-service training program for doctors, nurses, and nurse auxiliaries.

The MC/Bolivia in-service training program had four major objectives:

- 1. To improve the quality of care provided to mothers and newborns by health providers:**
 - recognize what is happening (normal and abnormal)
 - know what needs to be done (management at this level or emergency care with referral)
 - increase skill competency by level of provider
 - increase confidence in provider performance

- 2. To improve communication between women/their families and health providers:**
 - obtain a complete history from woman/family
 - initiate discussion with woman/family about issues that may be sensitive (family planning, need for referral, death, induction of abortion)
 - counsel women to improve compliance with recommended treatment regimes
 - involve woman/family in decision-making about management or treatment

3. **To improve record keeping:**
 - implement the use of partographs by all health providers
 - improve recording on prenatal care records and other medical records

4. **To improve the functioning of the medical team within a facility and from one level to another:**
 - understand each other's roles as a team in order to provide a team approach to services
 - remove structural barriers to the use of services or to the provision of high quality of services
 - remove client-perceived/cultural barriers to the utilization of services

In-service training centers were developed at the third level referral maternities in La Paz (Hospital de la Mujer) and Cochabamba (Hospital Materno-Infantil German Urquidi). Obstetricians, neonatologists, and nurses from these maternities attended the in-service training of trainers courses (TOT) in October and November 1996 and were selected as trainers. Four in-service training courses were conducted in La Paz and four in Cochabamba from February to July 1997. Each course included physicians, nurses, and nurse auxiliaries from the health posts, health centers, and district hospitals in the MotherCare areas. The selection of participants from the districts in La Paz and Cochabamba was done by the MSPS and MC/Bolivia staff. Each course was conducted over a four-week period, and it included theoretical content, practice with models, and clinical experience.

The in-service training course was purposefully different in the Bolivian context in several ways:

- physicians, nurses and nurse auxiliaries were trained as a team;
- teaching was organized with a team approach and responsibilities shared among trainers;
- competency-based, in-service training of clinical and counseling skills received as much emphasis as knowledge did, and
- adult learning techniques used case studies and discussions rather than lectures

The in-service training was designed to expose the trainers, some of whom also have responsibilities in pre-service education, and the providers to up-to-date adult teaching methods, to improve communication in new ways among the different types of providers in order to promote teamwork, and to introduce teaching methods to improve competency in clinical and interpersonal communication skills. Master trainers, who conducted the TOT courses, were chosen to serve as role models for this new type of in-service training as well as for their clinical expertise.

Some problems were encountered in the implementation of the in-service training. The ability of the trainers to role model after exposure to the master trainers was limited and some were able to change more easily than others were. Some trainers continued to use lectures as the main teaching method and did not follow the curriculum. Competition for clinical experience and commitment by trainers to provide oversight limited the clinical experience that the participants in the in-service training courses received. Although many teaching materials and models were purchased for each in-service training site they were not used to their maximal effectiveness.

In January 1998, a preliminary evaluation of the in-service training was conducted to field test the instruments/tools and methodology in preparation for the final in-service training evaluation. It was also anticipated to collect some data to get an idea of how well the objectives were being met and

to see if the in-service training improved the use of the protocols. It was conducted at that time to capture the approximately 30 percent of providers who had been trained but would either finish their rotation year or retire in early 1998. The staffing of physicians and some nurses in health centers, particularly in rural areas, relies on the posting of new medical and nursing school graduates for one year to these sites. This contributes to the constant turnover in staff. In reality, the nurse auxiliaries are the most permanent providers in the system. The preliminary evaluation at that time provided an opportunity to document the extent of the turnover. It also was used to help



determine the need for revisions in the evaluation instruments, and to make recommendations for changes in the implementation of the in-service training.

The preliminary evaluation identified positive and negative aspects of the in-service training course from interviews with course trainers and participants. Modifications to address some of the participants' and trainers' observations were incorporated into the final four courses in 1998 (two La Paz and two Cochabamba) in order to improve the overall content and manner of teaching. The curriculum was revised to reflect an approach that was based on presenting signs and symptoms rather than a clinical diagnosis (e.g., vaginal bleeding in the third trimester rather than placenta previa and abruptio placenta). The procedures manual and clinical skill checklists were also revised. To address the request for more clinical practice, more time was spent in practice with clinical models purchased for the course, night shifts in the maternity were created for the participants, and the participants were distributed to more clinical wards to decrease the number of trainees per ward.

Twelve courses provided in-service training for 291 participants in the La Paz and Cochabamba health districts (1997 to 1998). In La Paz and Cochabamba, 43 and 42 participants, respectively, completed courses five and six.

After the courses were completed, follow-up visits were made by the MC/Bolivia team to the health posts, health centers, and hospitals. By May 1998, 25 percent of the health posts, 50 percent of the health centers, and 100 percent of the hospitals had at least one visit. These training/supervision visits were designed as a key intervention to provide support to the trained health care providers after they returned to their facilities. Despite limitations in the implementation of the in-service training, providers expressed appreciation for the in-service training and demonstrated an increased ability/confidence in providing care during these visits. MotherCare views the in-service training and the follow-up visits as equally important to improve the quality of care being provided. The experiences from the visits conducted by the MC/Bolivia team will form the basis for the development of a supervision plan and a training supervision course for those responsible for overseeing the health care in the districts.

Methods

This evaluation was conducted in Bolivia in January 1999. The evaluators worked as a team to revise and translate the evaluation tools. Miguel Ugalde, MD was the in-service training director, and Connie Conover, CNM served as the external evaluator.

A convenience sample of participants was selected from the providers who received the MotherCare in-service training in the MotherCare districts in La Paz and Cochabamba (identified as TRAINED, N=17). A sample of providers who had not received the MotherCare in-service training was selected from a non-MotherCare district, Iliampu (identified as NON-TRAINED, N=11). Providers included in the 1998 preliminary evaluation were excluded (12 in MotherCare districts and 11 in Iliampu). None of the NON-TRAINED sample had received any maternal/child health in-service training in the past three years. The providers worked in similar settings including: health posts (nurse auxiliary only), health centers, and district hospitals (physician and nurse and/or nurse auxiliary). An additional interview was given to the TRAINED providers to elicit information about the three things that were most useful and least useful about the course and how the functioning of the "medical team" had or had not been impacted by the in-service training.

To decrease evaluator travel time, participants were requested to meet at a central location to be evaluated. This maximized the effectiveness of the evaluation team, but it eliminated the opportunity to complete a record review at individual sites. The participants completed the written knowledge test and confidence checklist and worked together in teams to complete the clinical skills/case scenario. Teams included a combination of physicians, nurses, and auxiliaries working together in groups of two or three people. The evaluation process took approximately 2½ hours for each team to complete. The order of these tools varied with some providers completing the written knowledge test and level of confidence assessments after the skills assessment/case scenario. These were followed by a complication audit for all participants and individual interviews for the TRAINED providers. To assess the application of skills, models used in the training for demonstrating delivery and newborn resuscitation were used.

All health facilities had a copy of the MC/MSPS protocols. The providers in Iliampu attend more births at home than the providers in the MotherCare districts; therefore, providers in Iliampu may not have been as exposed to the protocols as those in the MotherCare districts.

Evaluation Tools (see **Appendix A** for copies)

To assess the major objectives of the in-service training program, five tools were developed and used (see **Table 1**)

Three of the evaluation tools (skill assessment, complications audit, and interview) were used in the preliminary evaluation in 1998 and they were revised for this evaluation. Two additional tools (level of confidence skill assessment and the written knowledge test) were developed for this evaluation by MotherCare/Washington. The tools were reviewed and translated in Bolivia prior to the final evaluation.

**Table 1
Tools to Measure Performance to Meet Objectives**

	Knowledge Test	Level of Confidence	Skill Assessment	Complication Audit	Provider Interview
Improve care provided to mothers/babies					
Recognize what is happening	X	X	X	X	
Know what needs to be done	X		X	X	X
Be able to do it competently			X	X	X
Have the confidence to do it		X	X	X	X
Improve communication with women/families					
Obtain more complete history		X	X	X	X
Initiate discussion about sensitive issues		X	X	X	X
Counsel woman to improve compliance		X	X	X	X
Involve woman/family in decision-making			X	X	X
Improve record keeping					
Implement partograms			X	X	X
Improve recording on records	X	X	X	X	X
Improve functioning of the team					
Understand roles	X	X	X	X	X
Work to remove structural barriers				X	X
Work together to remove cultural barriers				X	X

Written Knowledge Test

The knowledge test originally consisted of 25 multiple-choice questions each dealing with a case scenario to test application of knowledge. Aspects of care/complications included: prenatal care, labor, newborn evaluation, postpartum infections and birth control. Six test questions were dropped from the analysis after the first day of the evaluation when it became evident that they needed to be revised. The test required 20 to 40 minutes to complete.

Level of Confidence Skill Checklist

This tool was designed to identify provider's self-reported confidence level in specific maternal/neonatal skills. Providers were asked to answer each question according to their comfort level with a "yes" (two points), "a little" (one point), or "no/no response" (zero points). Categories and number of questions included: interpersonal communication skills/counseling (six questions), prenatal care (14 questions), intrapartum care (18 questions), newborn care (five questions), and postpartum care (three questions). Completion of the checklist took 10 to 15 minutes.

Clinical Skills Evaluation/Case Scenario

The case scenario of “Maria Eugenia” comprised four sections to evaluate the application of knowledge and skills in four aspects of maternal/newborn care:

- 1) prenatal care and risk assessment
- 2) intrapartum care and use of the partograph
- 3) immediate newborn care
- 4) management of postpartum hemorrhage

Clinical and interpersonal skills were evaluated using a skill checklist adapted from the in-service training course. The checklists were filled out for each examinee by one evaluator—the case scenarios were acted out/presented by the other evaluator. One evaluator served as “the patient” in attempt to capture the provider’s use of interpersonal skills, and models were used to demonstrate skills. All participants were evaluated by both evaluators. Each provider was individually assessed for the prenatal care component of the scenario. In the interest of time, for the other three aspects of the scenario, credit was given if all providers responded at the same time. This was supplemented by some directed questions when necessary. Following the evaluation, both evaluators reviewed the checklist together to make sure they were in agreement with the skills performed. The scenario was adapted to fit the type of facility in which the provider worked. The TRAINED providers were asked to provide care as they were taught in the in-service training program.

In the first section of the case scenario, providers conducted an appropriate prenatal interview and patient history using the prenatal flow sheet (Historia Clinica Prenatal Base–HCPB) to identify the provider’s ability to complete records accurately. This was followed by a physical exam (general and obstetrical), laboratory evaluations, and risk identification, and an appropriate plan of patient care/counseling was to be developed.

In the second section, Maria Eugenia returns to the provider in labor. Management of her labor with identified problems, potential problems and risk factors, and use of the partograph were evaluated. A mannequin baby was used to demonstrate newborn care, stimulation, and evaluation of the APGAR score at one and five minutes.

In the final segment of the case scenario, the providers were asked to demonstrate the procedures for the management of postpartum hemorrhage using a model. The providers were also asked to provide the appropriate counseling for postpartum follow-up.

The checklist, used with a team of two to three participants, had 127 questions related to application of skills and management interventions: prenatal care (71 questions-55%), intrapartum care (17 questions-13%), newborn care (nine questions-8%), and management of postpartum hemorrhage (30 questions-24%). Interpersonal communication skills were integrated throughout the case (22 questions), as were anemia treatment and control skills (14 questions). Each question was worth two points if the skill or management was correctly applied, one point if the skill or management was partially-correct or prompted, and zero points for not applying or incorrectly applying the skill or management. There were 254 possible points. Administration of the case scenario for a team of two to three participants took approximately two hours.

Complication Audit

The complication audit was adapted from a tool used in the MC/Bolivia team's follow-up visits. The audit was used to identify the types of complications TRAINED providers have encountered and to define how the knowledge and skills learned in the in-service training were applied in the decision-making and management of a complication in a real-life situation. NON-TRAINED providers were asked to share a recent complicated case to see what types of complications they handled and their management. Completion of the audit in one-on-one interviews took five to ten minutes.

MotherCare Course Review Interview

The course review was a one-on-one interview with the TRAINED providers to identify aspects or skills they received in the in-service training that they found useful and not useful. In addition, the evaluators asked if the in-service training had improved the way the "medical team" was working together. The interview took five to ten minutes to complete.

Analysis

Data were entered and analyzed in *EPI-INFO, Version 6*. The responses of the TRAINED providers were compared to those of the NON-TRAINED.

Mean scores were calculated for the knowledge test (percent of questions answered correctly), the level of confidence skill checklist (absolute and percentage), and the clinical skill assessment (absolute and percentage). Overall score for the level of confidence skill checklist was obtained by adding the points for each skill included on the list. Overall score for the clinical skill assessment was obtained by averaging the percent mean score for each of the four skills, giving each skill equal weight. Because the mean scores were not necessarily normally distributed, non-parametric statistics (Kruskal-Wallis test) were used to determine P values. These analyses were repeated for just the nurse auxiliaries, as it was suspected that the in-service training would have the greatest impact on this cadre of providers. Frequency distributions were used to compare the response for individual skills with the response dichotomized into YES (demonstrated skill or felt confident) or NO (any other response-"little bit"/prompted, "no"/no response). Chi-square or Fisher exact was used to determine P values. Statistical significance was set a $P < 0.05$.

The small numbers included in the evaluation limited the ability to determine statistically significant differences between TRAINED and NON-TRAINED provider groups for individual skills on the level of confidence checklist or among individual actions/items on the skill checklist. The sample size allowed a detection of differences of 50 to 60 percent at 95 percent confidence and 80 percent power. This prohibited an analysis to discern any differences in individual skills among provider type (physician, nurse, and nurse auxiliary).

Results

The seventeen TRAINED providers included in the evaluation were from the MotherCare districts—ten from La Paz and seven from Cochabamba. Eleven providers from the non-MotherCare district (Iliampu) were included as the comparison group. **Table 2** presents the population from which the sample of providers included in the evaluation was drawn. The majority of the providers included in the evaluation were from health centers (71% in TRAINED and 72% in NON-TRAINED) and were nurse auxiliaries (59% in TRAINED and 64% in NON-TRAINED). All of the doctors, two of the nurses, and five of the auxiliaries were trained in the courses conducted after the 1998 preliminary evaluation.

Only 108 of 387 (28%) providers staffing facilities in the three MotherCare districts in January of 1999, participated in the MC/MSPS in-service training program. Of the 291 providers trained by MC/MSPS in 1997 and 1998, 183 were no longer working in the districts at the time of the evaluation (63%). Fifty-eight of the 72 physicians (81%), 23 of the 38 nurses (61%), and 102 of the 181 nurse auxiliaries (56%) had retired or moved.

Knowledge Test

Overall scores did not differ between the TRAINED and the NON-TRAINED providers when compared (mean scores 70% and 60% respectively, $P=0.22$) and when only nurse auxiliaries were compared (mean scores 68.5% and 57% respectively, $P=0.30$). In general, when looking at the

Table 2 Distribution of Providers									
	Physicians			Nurses			Auxiliaries		
	TOTAL	TRAINED	SAMPLE	TOTAL	TRAINED	SAMPLE	TOTAL	TRAINED	SAMPLE
MotherCare Districts									
Health Posts	NA	NA	NA	1	0	0	42	5	2
Health Centers	83	4	4	25	4	2	96	43	6
Hospital	59	2	2	15	3	0	66	15	2
Total	142	6	6	41	7	2	205	63	10
Iliampu District									
Health Posts	NA		NA	0		0	33		1
Health Centers	7		2	1		2	14		4
Hospital	5		0	5		0	26		2
Total	12		2	6		2	73		7
TOTAL TRAINED	Total number of providers at the facility in January 1999								
SAMPLE	Number of providers who received MC/MSPS in-service training, were at the facility in January 1999, and did not participate in the preliminary evaluation at the facility in January 1998. This was the population from which the sample for the MC districts was drawn.								
NA	Number of providers included in the evaluation								
	Not Applicable as no physicians staff health posts								

responses to each question and comparing by in-service training, a higher percentage of TRAINED providers were able to identify the expected fundal height at 16 weeks gestation, and the appropriate management for the delivery of the placenta (third stage), for a woman with antepartum hemorrhage and for a woman in early labor status (see Appendix B for frequency distribution of correct answers). NON-TRAINED providers seemed to be able to define the activities required at each prenatal visit better than the TRAINED providers. However, none of these differences were statistically significant.

Some general observations can be drawn from these results. Less than 50 percent of the providers in both groups were able to correctly calculate an APGAR score, describe a key feature in the management of a breech delivery, or identify three common causes of fetal demise. Most participants were able to correctly identify gestational age and estimated due date, although fewer were able to correctly identify appropriate uterine growth for 16 weeks. Although many answered that the partograph should be initiated and completed for all births, very few providers evaluated actually use this tool. The detection of a breech presentation was much better than the proper management for delivery. The signs of postpartum endometritis were well recognized by all. Most providers were able to correctly answer that direct skin to skin contact for mother and newborn is the best manner to maintain the appropriate body temperature, but few were able to identify that syphilis, cord accidents, and diabetes can all contribute to fetal demise.

Finally, there is confusion about the correct definition of the Lactational Amenorrhea Method for family planning among the providers. Although most were able to identify that exclusive breastfeeding can provide protection against pregnancy for up to six months postpartum, only half understood that amenorrhea and exclusive breastfeeding had to be included for this method to be considered an effective method of birth control

	Potential points	Mean Score All Providers			Mean Score Only Auxiliaries		
		TRAINED N=17	NON-TRAINED N=11	P value	TRAINED N=10	NON-TRAINED N=7	P value
IPC/C	12	10.4 (86%)	9.9 (83%)	0.71	10.2 (85%)	8.9 (74%)	0.29
PNC	28	22.1 (79%)	19.6 (70%)	0.15	20.5 (73%)	17.6 (63%)	0.11
LD	36	25.2 (70%)	22.2 (62%)	0.19	24.2 (67%)	20.0 (55%)	0.06
NB	10	9.6 (96%)	8.5 (85%)	0.03	9.5 (95%)	8.0 (80%)	0.04
PP	6	4.9 (81%)	3.4 (56%)	0.01	4.7 (78%)	2.9 (48%)	0.01
Overall	92	72.2 (79%)	63.6 (69%)	0.13	69.1 (75%)	57.3 (62%)	0.05
IPC/C	Interpersonal communication/counseling						
NB	Newborn care						
PNC	Prenatal care						
PP	Postpartum						
LD	Care in labor and delivery						

Level of Confidence Skills Checklist

Although the overall score for the level of confidence in skills was higher among the TRAINED providers (79%) compared to the NON-TRAINED (69%), the difference was not statistically significant ($P=0.13$), see **Table 3**. When only auxiliaries are compared, the trend in more confidence among the TRAINED group approaches statistical significance ($P=0.05$). When the skills are grouped by content area, the same higher trend is seen among the TRAINED providers with statistically higher scores for confidence in skills related to newborn care and postpartum infections.

To identify if there were differences in specific skills, reported confidence in the ability to perform individual skills was compared between the TRAINED and NON-TRAINED providers. TRAINED providers were statistically more confident in identifying a woman with severe pre-eclampsia, managing a woman with severe anemia and with mastitis, and estimating blood loss. Skills in which their increased confidence approached statistical significance included managing a woman with severe pre-eclampsia/eclampsia, identifying a woman with anemia using clinical signs, delivering a woman in an alternative position, and using skills to assess need for resuscitation and for referral of newborns, see **Table 4**. See **Appendix C** for frequency distribution of reported confidence in performing of individual skills by all providers and by nurse auxiliaries.

Even after the in-service training, more than 50 percent of the providers did not feel confident in performing a vaginal exam to size the uterus; identifying size-date discrepancies; managing a woman with bleeding after 28 weeks gestation; filling out a partograph, delivering breech or twin pregnancies, managing a shoulder dystocia, performing bimanual compression, manually removing a placenta; or managing a women with postpartum uterine infection. In fact, the level of confidence for some skills was reported at higher levels, though not statistically significant higher levels among the NON-TRAINED providers

Clinical Skills Evaluation/Case Scenario

Mean scores for the clinical assessments were statistically higher among the TRAINED providers when all providers were compared and when nurse auxiliaries were compared, see **Table 5**. This observation held true when overall percent mean score for all four clinical skills were compared between TRAINED and NON-TRAINED provid-

Table 4 Frequency Distribution of Reported Confidence Level in Skills		
	TRAINED N=17	NON-TRAINED N=11
Level of significance $P<0.05$		
Identify a woman with severe pre-eclampsia	88%	46%
Know what to do for a woman with severe anemia	88%	36%
Estimate blood loss at delivery	88%	46%
Manage a woman with postpartum mastitis	82%	18%
Level of significance $0.05>P<0.10$		
Know what to do for a woman with severe pre-eclampsia/eclampsia	77%	36%
Identify a woman with anemia by clinical signs	88%	55%
Deliver a woman in an alternative delivery position	82%	46%
Determine if baby needs resuscitation	94%	64%
Perform neonatal resuscitation	88%	55%
Determine if newborn needs referral	94%	64%

Table 5
Absolute (Percent) Mean Scores for Skill Assessment/Case Scenario

		Mean Scores All Providers			Mean Scores Only Auxiliaries		
	Potential points	TRAINED N=17	NON-TRAINED N=11	P value	TRAINED N=10	NON-TRAINED N=7	P value
PNC	142	94.8 (67%)	73.8 (52%)	0.002	87.0 (61%)	72.0 (51%)	0.03
LD	34	22.6 (66%)	17.9 (53%)	0.03	20.1 (59%)	16.3 (48%)	0.05
NB	18	11.7 (65%)	8.7 (49%)	0.01	10.2 (56%)	7.9 (44%)	0.05
PPH	60	35.1 (59%)	23.5 (39%)	0.001	31.4 (52%)	23.3 (39%)	0.02
Overall Score		64%	48%	0.004	58%	45%	0.02
IPC/C	44	25.2 (57%)	17.5 (40%)	0.001	23.9 (54%)	17.6 (40%)	0.008
Anemia	28	20.8 (74%)	13.3 (48%)	0.001	18.7 (67%)	12.3 (44%)	0.004
TOTAL PNC	Prenatal care, care in labor and delivery, newborn care and management of postpartum hemorrhage						
LD	Prenatal care						
NB	Care in labor and delivery						
PPH	Newborn care						
IPC/C	Management of postpartum hemorrhage						
Anemia	Interpersonal communication/counseling skills in prenatal care, care in labor and delivery, newborn care and management of postpartum hemorrhage						
	interventions to address anemia prevention and control in prenatal care, care in labor and delivery, newborn care and management of postpartum hemorrhage						

ers, as well as when comparing mean scores for individual skills related to prenatal care, care during labor and delivery, immediate assessment and management of newborn, management of postpartum hemorrhage, interpersonal communication and counseling, and anemia treatment and prevention

To better understand these differences the ability to correctly apply a particular item/action on the skill checklists for the case scenario was compared between TRAINED and NON-TRAINED providers. These results can be found in **Appendix D**. Differences in skills identified as statistically significant ($P < 0.05$) and those approaching statistical significance ($0.05 > P < 0.1$) are included in **Tables 6 and 7**.

TRAINED providers were more likely than NON-TRAINED providers to recognize the size-date discrepancy in fundal height measurement, stimulate a slightly depressed baby and prevent neonatal hypothermia by drying the baby immediately after delivery, and provide more detailed counseling to treat severe anemia. They were also more likely than NON-TRAINED providers to recognize all the causes of postpartum hemorrhage and more appropriately manage the postpartum hemorrhage with uterine massage and oxytocin, as well as provide care in a mother-friendly manner (avoid enemas and pubic shaves, to involve the mother in decision-making around care issues).

The following are some general observations made by the evaluators as they conducted the skill assessment/case scenario:

Prenatal Care Skills

All providers consistently greeted the patient appropriately, and remembered to include family members in the visit. However, most did not use the interpersonal concepts to clarify the patient's chief complaint, or gather key information about her closely spaced pregnancy, severe fatigue, and shortness of breath. Instead, the providers appeared more focused on filling out the prenatal flow sheet (HCPB). All providers demonstrated confidence in using the HCPB for information gathering and correctly filled it out. Most providers had to be prompted to elicit questions about other current pregnancy problems, and few asked questions about past pregnancy or labor problems. These questions were often overlooked but were important to identify certain risk factors, including past history of a prolonged labor and postpartum hemorrhage, which would be significant later in the scenario.

Table 6 Differences (P<0.05) in Frequency Distribution of Correct Application of Skills Identified in Skill Assessment		
	TRAINED N=17	NON-TRAINED N=11
Prenatal Care		
* Offers a hand shake	77%	27%
Asks if she has had other problems in this pregnancy	41%	0%
Performs a vaginal exam (pelvic exam)	53%	0%
Recognizes that fundal height does not correspond with gestational age	65%	9%
*Explains to patient her plan of care for the identified problems/risks	47%	9%
@ Explains dietary measures to treat anemia	88%	36%
@ Administers her iron folate tablets	41%	0%
@ Indicates how to take iron/folate (citrus, avoid coffee/tea)	88%	9%
* Explains that she can deliver in whatever position she chooses	82%	18%
Intrapartum Care		
Avoids enemas	41%	0%
Avoids pelvic shaving	65%	18%
Newborn Care		
Dries/rubs the baby with dry, warm towel	88%	18%
Management of Postpartum Hemorrhage		
Identifies lacerations as potential cause of PPH	100%	64%
Takes pulse and BP	88%	18%
* Explains to patient what happened	53%	0%
@ Prescribes iron/folate 3 tablets per day	47%	9%
*Interpersonal communication and counseling skills @ Anemia prevention and control skills		

The physical exam, in general, was complete and done well by all providers. The TRAINED providers were more likely than NON-TRAINED providers to seek the woman's permission after explaining the exam. Most of the providers included vital signs, blood pressure, height, and weight, as well as an inspection for signs of anemia, a breast exam, and an assessment for edema. Cardio-pulmonary and renal assessments for signs of infection were rarely included by any of the providers. The obstetrical exams were consistently done, almost everyone checked for fetal presentation and heart tones and could identify normal ranges. Although most providers said uterine size was important, not all understood the concept of what the measurement meant and how to correlate

the measurement with gestational weeks. In reality, few patients are offered a vaginal exam due to cultural reasons, although some providers realized the importance of offering the exam and respecting the patient's option to decline.

Solicitation of laboratory examinations was low. This area generally falls outside of the auxiliaries scope of practice because of the unavailability of laboratories in rural services. Some knew what to order, but did not know for what condition they were testing. For example, one provider wanted to order an RPR and knew it was testing for an infection but did not know it was specific for syphilis. Pap smears were almost entirely a foreign concept, although a few nurse auxiliaries knew that it was a test to detect cancer but did not know what type. Few, including physicians, could accurately interpret the hemoglobin result of 9.3 grams as severe anemia

(severe anemia is <9.4 grams for La Paz and Cochabamba altitudes). They were aware that anemia was present with the symptoms of fatigue, shortness of breath, and pale conjunctivas during the physical exam, but they could not interpret the numerical lab values.

The identification of potential problems or existing problems was not done well without prompting. Less than 40 percent of the providers were able to identify that a history of a past postpartum hemorrhage places the mother at risk for a repeat episode with her next birth. Closely spaced pregnancies (less than two years between births) was more easily recognized as a problem. While most providers were able to say that the patient had some level of anemia, few were able to identify this level as severe and recognize that anemia increased the risks for postpartum hemorrhage and intrauterine growth retardation. In this case scenario, there was mild discordance—30 weeks by fundal height and 32 to 33 weeks by gestational age. This evaluated the provider's ability to assess the growth and well-being of the fetus. The ability to interpret the inconsistency between the fundal height measurement and the estimated gestational weeks by dates was significantly higher among the TRAINED providers.

TRAINED providers were more likely than NON-TRAINED providers to address anemia through treatment with iron/folate tablets and to provide information about how to take the iron to maximize absorption. They also provided information on dietary sources of iron. Even with the in-service training, counseling on place of delivery, family planning, breastfeeding, and lactational amenorrhea was poor. Counseling on breastfeeding and family planning was more commonly offered following delivery. None of the providers gave information on sexually transmitted diseases.

Table 7 Differences (0.05<P<0.10) in Frequency Distribution of Correct Application of Skills Identified in Skill Assessment		
	TRAINED N=17	NON-TRAINED N=11
Prenatal Care		
* Obtain permission from woman for exam	59%	18%
@ Requests a hemoglobin or hematocrit if available	77%	36%
Requests a group and RH (blood type) if available	82%	46%
* Explains that she will be kept covered and warm during labor and birth	41%	9%
Management of Postpartum Hemorrhage		
Massages uterus and evacuates clots	77%	36%
Gives oxytocin IV drip or IM	35%	0%
Inspects birth canal and cervix for lacerations and repairs them, if indicated	100%	73%
Puts woman in Trendelenburg Position	59%	18%
Continues to massage the uterine fundus	41%	9%
* Interpersonal communication and counseling skills @ Anemia prevention and control skills		

The MC/MSPS in-service training focused on several concepts to make the birth more culturally acceptable to families. These include: the family members' participation during the labor/birth, the opportunity to freely choose her birth position, the choice to have the placenta returned to the family, and the need to keep the woman warm and covered during the labor/birth and postpartum period. All providers were sensitive to most of these issues and offered these concepts freely. TRAINED providers were more likely than NON-TRAINED providers to discuss with the woman her ability to choose her delivery position and to ask for a blanket if she needs it for warmth and covering.

In general, the conclusion of the prenatal visit and patient education were not done well by either TRAINED or NON-TRAINED providers.

It has been taken into consideration that the vast number of topics included in this evaluation would be extremely difficult to cover in one prenatal visit. However, in order to give the providers every opportunity to share their knowledge and skills as comprehensive a list as possible was included.



Skills for Labor Management and Use of the Partograph

This section of the skill assessment/case scenario attempted to assess skills used in labor management and use of the partograph. Only the avoidance of shaves and enemas differed between the two groups; however, in practice, it appears that some inconsistency remains with the use of enemas and perineal shaving. Some of the patients decline these procedures, and it appears that the choice is respected. Some of the nurses and auxiliaries perform the procedures only when a physician (usually one who has not attended the in-service training) orders them.

All providers promoted early labor management, inclusion of family members in the care, ambulation, and oral fluids. Most providers were able to identify the correct preparation of intravenous fluids and oxytocin, which they have on hand for the risk factors of anemia and a past history of hemorrhage. Appropriate warming of the birth room, babies clothing, and preparation of the delivery equipment was consistently demonstrated.

Few providers were able to initiate or complete the partograph, although it was one of the topics of the in-service training. The nurses and auxiliaries used the "labor" section of the HCPB to note the maternal and fetal vital signs, but they did not know how to construct the graph or alert curve on the partograph. Only partial credit was given if vital signs were noted during the labor scenario. The partograph is one of the records that is rarely used in real practice. None of nurses or auxiliaries attempted to fill out the partograph, although they received the training, and few of the physicians are using the partograph in their monitoring of labor. The providers from two hospitals in the MotherCare districts reported that every labor has a partograph filled out by the physician. When asked why the providers in the health centers and posts were not using partographs, many providers indicated they did not have them available at their sites because the Ministry of Health had not sent them. The providers who attend home births said they are called to the homes not for the labors, but when birth is imminent or when there is a complication that requires immediate attention, so they do not use the partographs. Other physicians said they had not incorporated them into their routine, or did not know how to use them. It appears that until the providers feel that the

partograph is a useful tool, they are not going to use it. The partograph requires more than inclusion in an in-service training program to be successfully implemented as a monitoring tool and medical record.

Newborn Care Skills

Although all TRAINED providers were familiar with the evaluation of the APGAR, most nurses and auxiliaries needed prompting on how to calculate the score. In the case description, the correct APGAR score at one minute was six, which indicates the need for neonatal stimulation, not resuscitation. While most of the providers realized that the baby required stimulation and suctioning/removal of secretions, the TRAINED providers were more likely to use complete drying of the baby as a method to stimulate and to maintain warmth. Providers were better able to correctly assign an APGAR of nine at five minutes but this may have been due to the prompting with the initial one minute score. All providers were able to correctly verbalize that the baby should be wrapped warmly and be placed with the mother to initiate breastfeeding, and to assist with uterine stimulation and delivery of the placenta.

Skills for Management of Postpartum Hemorrhage

All participants were able to identify retained placental parts as a potential cause of postpartum hemorrhage. All of the TRAINED providers were able to identify lacerations as a possible cause. Identification of uterine atony was less common, although most providers were familiar with at least some of the interventions to address uterine atony. TRAINED providers were more likely than NON-TRAINED providers to include uterine massage and evacuation of clots as the first step. No one identified emptying a full bladder as a possible intervention. The concept of considering a blood transfusion was primarily foreign because most facilities did not have the capacity to administer one. All providers were ready to transfer the patient to a higher level facility if they had exhausted all life-saving measures.

Patient education following the control of the hemorrhage was not as comprehensive. Few providers discussed with the patient that future births should be attended at a health facility due to a history of two previous hemorrhages. TRAINED providers were more likely to explain to the husband/family what had happened and to prescribe an adequate dose of iron/folate postpartum (three tablets per day). Every provider offered information and counseling about family planning.

Complication Audit

Most of the providers were able to describe a complication they recently managed. Among the TRAINED providers the complications discussed included postpartum hemorrhage (4), malpresentation or prolonged labor (4), severe pre-eclampsia/eclampsia (3), pre-term delivery (2); fetal demise (2), and post-dates (1). Overall, the providers stated that they were better able to manage these obstetric complications due to the increased knowledge and skills from the MotherCare training course. Referrals were timelier and more easily initiated, especially within the referral chain.

Among the NON-TRAINED providers the complications mentioned included: malpresentation (4); eclampsia (3), and fetal demise (1). The NON-TRAINED providers did not provide as much detail about the cases. They seemed to be more likely to refer these women to a higher level without providing any stabilizing interventions. See Appendix E for details of the cases reported in the complication audit.

MotherCare Course Review Interview

This course review interview was conducted among the 17 TRAINED providers. The following is a summary of the results:

Most Useful Components of the In-service Training Program

Overall, the providers were extremely pleased with the course content and manner of teaching. Interpersonal communication skills is at the top of the list of newly acquired and utilized skills. It appears that problems with inadequate clinical practice as reported in the preliminary evaluation in January 1998, have been resolved. **Table 8** lists responses to the question of what three aspects of the in-service training were most helpful prefaced by the number of times the response was given by the 17 providers interviewed.

Many of the nurse auxiliaries reported that they no longer felt like objects of discrimination by the doctors. After the training, they felt more comfortable joining the discussion and offering solutions to solve problems. In addition, they felt more confident to counsel and prioritize certain kinds of interventions with recently graduated doctors or those who were new to the institution.

Less Useful Components of the In-service Training Program

Several auxiliaries at health post reported that they found the course content related to the management of twins, placenta previa, and placenta abruptio and the use of forceps (although this was not included as a topic in the curriculum) less useful because they did not deal with these at their facility level. One nurse auxiliary had not been able to apply her knowledge of the management of postpartum complications/infections at her site because she had not encountered any complications. One physician felt that course content related to partograph was not useful because this instrument is unavailable for use at her health center.

Two providers commented about combining provider types in the in-service training. One felt that the mix of the physicians, nurses, and auxiliaries was beneficial to the interpersonal

communications but disruptive during technical lectures due to the different knowledge bases. The recommendation was to continue bringing everyone together, but separate the physicians and nurses from the auxiliaries during clinical components. Another physician felt similarly about the attempt to combine health providers of different knowledge levels. Her concern was that some of the auxiliaries may attempt to treat some of the complications due to the new knowledge and not refer patients to facilities in a timely manner. Aside from these two constructive comments about the mixture of all provider types in the same in-service training, there were few negative comments about this aspect of the program.

Table 8 Most Useful Components of In-Service Training Course	
No. Times Mentioned	Component
10	Interpersonal communication skills
8	Newborn resuscitation/complications
6	Assessment and identification of risk factors Labor management
5	Patient counseling/education
4	Management/Resolution of complicated cases
3	When and how to refer complications
2	Prenatal care and use of the prenatal data base (HCPB) Family planning counseling Postpartum care/complications
1	Protocols Practicum with real patients

Evaluation of the Impact of the In-service Training Program on Teamwork

All of the providers interviewed felt that the MC/MSPS in-service training had in some way positively impacted the manner in which the medical team works together, whether it be in their own health care facility or throughout the referral chain. The auxiliaries especially felt empowered and a worthy part of the health care team. Table 9 lists the responses to the question on how the course helped the participants function as a health care team, prefaced by the number of times the response was given.

No. Times Mentioned	Component
7	-Better team coordination and ability to work with all staff members at the health facility
4	-Improved coordination of patient care. All members of the team are aware of each others specific functions and roles -Improved referral between health posts/health center/hospitals - more timely referrals with better outcomes
3	-Improved team interpersonal communications
2	-Auxiliaries have increased participation with births at the health center with the physicians supervision -Auxiliaries have the confidence to offer clinical suggestions to physicians
1	-Improved patient counseling/education -Able to be supportive of alternative birth positions as a team

Conclusions

The evaluation indicates that the MC/MSPS in-service training program has improved the quality of care provided in the MotherCare districts in Bolivia. It appears that the in-service training program has been able to improve the care provided to mothers and newborns by health providers, the communication between women/their families and health providers, and the functioning of the medical team within a facility and from one level to another. It has been less successful in improving record keeping through the implementation of partographs by all health providers.

Although no difference was detected in mean scores of the knowledge test, more confidence was reported by TRAINED providers in skills related to newborn and postpartum care, and statistically significant differences in mean scores were found in six content areas included in the skills assessment: prenatal care, care in labor and delivery, immediate newborn care, management of postpartum hemorrhage, interpersonal communication and counseling, and anemia treatment and control. The increased ability of the TRAINED providers to describe the complicated cases they managed and the actions they took in these cases also indicates improved quality of care.

The evaluation was able to identify the areas where the MotherCare in-service training program significantly improved care and where deficits still remain. In addition, the evaluation was able to identify areas where providers seem to have the necessary knowledge and skills.

The in-service training program improved the ability of providers to recognize the importance of anemia and to counsel women about nutritional interventions and iron/folate supplementation. The deficit in the provision of iron tablets may reflect the unavailability of iron tablets in some health facilities. The program improved the providers' ability to interpret the information they gathered (identification of size-date discrepancy), although not universally. This may reflect the complexity of increasing providers' ability to put things together and make judgements. This deficit was more evident among the nurse auxiliaries whose basic education may not have focused on this aspect.

Certain essential life-saving skills in the management of postpartum hemorrhage (uterine fundal massage, initiation of intravenous, and use of oxytocin) were implemented more often by the providers who had undergone in-service training and approached statistical significance. The use of two key skills for the management of postpartum hemorrhage (bimanual compression and manual removal of the placenta) was lower. This finding highlights the need to emphasize these skills in continuing education courses.

The importance of drying and stimulating a slightly depressed newborn immediately after delivery was recognized by the TRAINED providers. The in-service training program, in addition to including newborn resuscitation, improved the confidence and ability of providers to differentiate newborns who need stimulation from those who need resuscitation and to correctly assign an APGAR score. These skills underscore the importance of provider precision in assigning an APGAR score in order to make an adequate assessment.

In general, the MotherCare/Bolivia in-service training program has placed special emphasis on several areas: changing the "atmosphere" in which services are provided so they are more culturally appropriate and client/family-friendly; improving provider performance in handling complications; increasing iron supplementation to reduce the prevalence of anemia; and improving teamwork among the various members and levels of care.

Despite these improvements, the generally low scores among those who received the in-service training (range from 57% to 74%) and the even lower scores among those with no in-service training (range 39% to 52%) highlight the need for continuing education to strengthen providers' skills in maternal and newborn care. This also reflects inadequacies in the basic educational programs of physicians, nurses, and auxiliaries. A four-week, in-service training course cannot fill the gaps left after a two- to four-year, pre-service education program in nurse auxiliary, nursing, and medical schools. This low ability to provide quality care is compounded by the high turnover rate among providers, as indicated by the low percentage of providers who had participated in the in-service training program at the time of the evaluation (28%). These two issues highlight the inadequacy of relying on in-service training to address the knowledge and skill deficits among providers. This problem is being addressed among the physicians with the inclusion of a curriculum in the medical schools of two universities (Universidad Mayor de San Andes and Universidad de San Simon). However, curriculum updates for nurses, auxiliaries, and physicians needs to be universally addressed.

Once new skills are acquired, whether as a new graduate or following an in-service training program, interventions that include supervision to support the providers and continuing education at local levels are needed to strengthen and maintain skills. This need is demonstrated by the continuing low levels of use of the partographs to monitor labor, despite its inclusion in the in-service training program. Providers report that they are not generally available and hence rarely used. This highlights the need for support from all levels, beyond the inclusion of the use of the partograph in in-service training, to implement policies. The level of complexity of the CLAP partograph requires more practice and continuing follow-up, and it is well known that practice is necessary to maintain competency in skills.

Recommendations

The results of this evaluation should be useful to the MSPS and JHPIEGO's Maternal and Neonatal Health Program as they plan for continuing activities in Bolivia. The tools used in the evaluation are also suited for providing baseline data in any new areas and if desired, specific assessment of obstetrical skills of general doctors.

Specific recommendations include:

- Continue this type of competency-based, in-service training with a mix of provider types (doctors, nurses, and auxiliaries) to promote teamwork.
- Based on the evaluation results and the experiences of the trainers and trainees, a review of the curriculum should be made by the trainers to define those areas that need more emphasis and those that can be eliminated or de-emphasized. In addition, issues related to implementation could be addressed. The following areas are recommended for inclusion:
 - interpersonal communication and counseling skills
 - use and management of IEC materials for patient education
 - use of medical records and registers, including partograph
 - use of appropriate technology, including pinard fetoscope and tape measure
 - importance of signs and symptoms of anemia in pregnancy
 - importance of correct measurement of weight, height, and vital signs
 - prenatal care, including screening for STDs and RPR for syphilis, iron/folate supplementation, etc.
 - uterine massage for control of postpartum bleeding
 - blood transfusion and indications
 - appropriate use of ergometrine and oxytocin
 - management and appropriate referral of pregnant women with problems (eclampsia, shock, etc)
 - appropriate care in labor and screening for indications for referral
 - care and management of the normal newborn
 - assessment, care, and referral of the newborn with complications and risks
- Because the in-service training program is based on the MC/MSPS protocols, a review of the protocols is also advised. In addition, a mechanism to review the protocols and curricula (basic, in-service, and continuing education) at three to five year intervals will help assure updating and congruency
- Currently, testing for syphilis is restricted to facilities with labs, and the importance of this problem in Bolivia is not well recognized by the providers. A national policy and plan to train providers to screen, treat, and counsel for syphilis in pregnancy has been established with MSPS. Thus syphilis screening with RPR and treatment needs to be incorporated into all levels of the service and into basic education programs
- To meet the demands placed on providers, educational programs need to revise their curricula and criteria for completion so those new graduates are equipped with the necessary skills. Universidad Mayor de San Andres and Universidad mayor de San Simon have begun revisions. In-service program needs to be integrated with basic educational programs and with

on-going training supervision and continuing education at local level. Once a good basic curriculum is in place, more attention needs to be focused on two other areas: integration and sustainability.

- Immediate attention must be placed on the lack of use of the partograph. A partograph is an essential screening and monitoring tool for providers to use to help them care for women in labor. In addition, it should be seen as a key medical record. The responsibility of the municipalities and the national government should be clarified so that partographs are available, especially in health posts, health centers, and district hospitals. In addition, a strategy needs to be developed to motivate all doctors to use the partograph. Unless the partograph is universally used within a facility, the impact of the in-service training will not be maximized.

Appendix A

Evaluation Tools

Knowledge Test

COD: _____ Date: _____

Maria comes for prenatal care on January 13. She says that her last menstrual period was September 20.

1. Her gestational age at this visit is:
 - a) 30 weeks
 - b) 21 weeks
 - c) 16 weeks
 - d) 26 weeks

2. What is her expected due date?
 - a) 27 June
 - b) 23 August
 - c) c) 27 July
 - d) 15 May

3. Her uterine fundus should be:
 - a) at her umbilicus
 - b) between her pubis and her umbilicus
 - c) 30 centimeters above her pubis
 - d) two fingers above her umbilicus

4. The steps should be taken at every prenatal visit are:
 - a) ask if the woman has any problems
 - b) do a vaginal exam
 - c) take her height
 - d) all of the above

5. ~~Maria does not have any problems at this visit. What advice should be she given?~~
 - a) ~~to take 30 tablets of iron with tea or coffee~~
 - b) ~~to give her tetanus toxoid immunization, if indicated~~
 - c) ~~to avoid sexual relations during the pregnancy~~
 - d) ~~all of the above~~

Maria is pregnant for the second time. Her first birth was at home and the baby died 2 hours after birth.

6. ~~What advice should Maria receive about her delivery?~~
 - a) ~~she needs to go to the hospital if her labor is prolonged~~
 - b) ~~she needs to discuss with her husband that she needs to deliver in the hospital~~
 - c) ~~she needs to go to the hospital if the fetus is not _____~~
 - d) all of the above

Elena presents to your center with a fever, is pale, has a purulent vaginal discharge and amenorrhea for 11 weeks.

7. What condition do you suspect?
 - a) urinary tract infection
 - b) threatened abortion
 - c) septic abortion
 - d) severe anemia

8. —if you are a nurse auxiliary in a health post, you?
- a) — immediately refer to a health center or hospital
 - b) — suggest rest and medication to reduce the fever
 - c) — send her home with antibiotics
 - d) — all of the above

Ana is 32 weeks gestation and comes with bright red vaginal bleeding without any abdominal pain

9. You suspect:
- a) premature separation of the placenta (abruptio placentae)
 - b) placenta previa
 - c) threatened abortion
 - d) ruptured uterus

10. It is very important that you:
- a) do a vaginal exam to confirm the diagnosis
 - b) evaluate the amount of bleeding and the fetal and maternal condition
 - c) start induction of labor
 - d) a) and c)

Gloria is 40 weeks pregnant and comes to the health center for labor. She is low risk. Now, her contractions are 5 minutes apart, lasting 40 seconds. She is dilated 3 cms.

11. Her management is:
- a) allow her to walk freely
 - b) limit the liquids she drinks
 - c) give her an enema
 - d) all of the above

12. A partogram is used in cases of :
- a) labor with a high risk pregnancy
 - b) during labor in a hospital
 - c) preterm labor
 - d) in all cases

María returns to the health post at 37 weeks and has been in labor for 6 hours. She has a head ache and her BP is 140/96

13. What actions or decisions should you take?
- a) ask her if she has taken her iron tablets every day
 - b) do a vaginal exam to determine her stage of labor
 - c) refer her to the second level for treatment vel for hypertension
 - d) only b) and c)

Gloria had a spontaneous delivery of a girl who weighed 3 0 kilos. At one minute after birth, she was crying weakly, her heart rate was 105 her arms and legs were moving weakly she responded well to stimulation, her hands and feet were cyanotic and her body was pink

14. What Apgar score does this baby have?
- a) 3
 - b) 5
 - c) 7
 - d) 9

15. How would you manage this baby?
- ~~stimulate by drying and evaluate the Apgar another time.~~
 - ~~suction the secretions~~
 - ~~begin neonatal resuscitation~~
 - a and b
16. The actions you need to take to delivery Gloria's placenta are:
- pull on the cord to deliver the placenta
 - look for signs of placental separation: reappearance of the contraction, descent of the uterus and gush of blood from the vagina.
 - examine the placenta and membranes
 - only b) and c)
17. Elizabeth is a multigravida who comes for prenatal visit at 36 weeks. You suspect a breech presentation. Why?
- because the head is in the upper part of the fundus
 - because the fetal heart is heard well near the pubis
 - because on vaginal exam, you can feel a hard round mass
 - all of the above
18. ~~Elizabeth returns in two weeks and you see her when she is about to deliver her baby in breech presentation. What actions do you take?~~
- ~~refer to the hospital immediately~~
 - ~~attend to her delivery~~
 - ~~advise the family about the malpresentation~~
 - b and c
- 19 Elizabeth begins to push. For her delivery, you should:
- take the feet and buttocks and begin to pull down
 - make sure that the back of the baby stays upward.
 - when the arms are delivered, begin to pull on the head
 - all of the above
- 20 After delivery, Elizabeth begins to bleed although her uterus is well-contracted. What is the probable diagnosis?
- vaginal tears
 - atony of the uterus
 - endometritis
 - retained placental fragments
- 21 ~~In what cases do you do a manual extraction of the placenta?~~
- ~~if the bleeding is abundant and you know how to do the procedure~~
 - ~~if the placenta does not separate after 20 minutes, even if no hemorrhage~~
 - ~~if the mother is a grand multipara~~
 - all of the above
- 22 Maria delivered 5 days ago. Now, she has fever (temp is 38.2 degrees centigrade), she has uterine pain on palpation and foul smelling lochia. You suspect
- urinary tract infection
 - breast infection
 - endometritis
 - appendicitis
- 23 The best way to maintain body temperature and feeding in a preterm newborn without any problems is:
- warming box and bottle feeding
 - direct skin-to-skin contact with mother and breast feeding
 - incubator and nasogastric feeding
 - staying with mother and bottle feeding

24. Liliana had a fetal death. The probable cause is:
- a) maternal syphilis
 - b) umbilical cord abnormalities
 - c) diabetes
 - d) all of the above
25. Gloria delivered three days ago and her baby is breast feeding. She and her husband ask you about contraception. What is necessary for Gloria to use LAM (Lactation amenorrhea method)?
- a) complete or nearly complete breast feeding, less than 6 months after birth
 - b) amenorrhea, complete breast feeding, less than 42 days after birth
 - c) amenorrhea, complete or nearly complete breast feeding, less than 6 months after birth
 - d) amenorrhea, complete or nearly complete breast feeding, less than 1 year birth

Levels of Confidence

COD _____

Do you feel capable and confident to carry out the following clinical and counseling skills?

	Yes	Little	No
Interpersonal communication and counseling			
1. Comfortable counseling a new mother about breast feeding			
2. Comfortable counseling a couple about family planning			
3. Comfortable counseling a family about need to refer a woman urgently to next level of care			
4. Comfortable counseling a mother and her family who has just had a stillbirth/neonatal death			
5. Comfortable counseling a woman who is having side effects from iron folate tablets			
6. Comfortable counseling a woman whom you suspect has had an induced abortion			
Antenatal Care			
1. Obtaining history (medical, social, obstetrical, current pregnancy)			
2. Calculating gestational age and due date from LMP or other signs of pregnancy			
3. Performing a general physical examination			
4. Performing an abdominal examination (fundal height, fetal presentation, fetal heart rate)			
5. Performing a vaginal examination for sizing uterus			
6. Identifying size-date discrepancies (uterus is too big or too small for estimate gestational age by dates)			
7. Identifying a breech or transverse lie in third trimester			
8. Identifying twins			
9. Identifying a woman with severe preeclampsia			
10. Knowing what you should do for a woman with severe preeclampsia or eclampsia			
11. Identifying a woman who is anemic from clinical signs			
12. Knowing what you should do for a woman with severe anemia			
13. Knowing what you should do for a woman who is less than 28 weeks gestation and has bleeding			

	Yes	Little	No
14. Knowing what you should do for a woman who is 28 weeks or more gestation and has bleeding			
Intrapartum Care			
1. Monitoring a woman in labor			
2. Providing care for a woman in labor			
3. Filling out partograph			
4. Identifying a woman with abnormal labor			
5. Managing/monitoring a woman with oxytocin drip for induction or augmentation			
6. Attending a normal delivery			
7. Attending a woman delivering in an alternative position (on side, squatting, etc)			
8. Attending a woman delivering with a breech			
9. Attending a woman delivering twins			
10. Managing a delivery of a baby with shoulder dystocia			
11. Delivering a placenta			
12. Identifying perineal tears after delivery			
13. Repairing an episiotomy or perineal tear			
14. Estimating blood loss			
15. Managing a postpartum hemorrhage due to uterine atony			
16. Performing internal bimanual uterine compression for uterine atony			
17. Manually removing the placenta			
18. Managing a woman in shock			
Newborn Care			
1. Assessing the condition of newborn a deliver to determine need for resuscitation			
2. Performing neonatal resuscitation			
3. Providing care to a newborn			
4. Assisting a mother with breast feeding			
5. Determining when a newborn needs referral			

	Yes	Little	No
Postpartum Care			
1. Managing a woman with a postpartum uterine infection (endometritis)			
2. Managing a woman with a postpartum mastitis			
3. Determining when a woman needs referral for infection			

Case Scenario/ Clinical Skills Assessment

The case of María Eugenia Manriquez

COD _____

	Yes	So/so	No	NA
A. Prenatal Visit				
1. Greets her by name and invites her into the consulting room				
2. Encourages the participation of the husband or family				
3. Receives the pregnant woman in a friendly manner				
4. Offers a handshake				
5. Provides privacy for the consult				
<p>María Eugenia is a 21 year old who thinks she is pregnant - it has been 7 months since her last period. (this is her second pregnancy). She has come to the health post with her mother in law because she feels very tired and exhausted. She says: " I can't run after my pigs, doctor, because I am short of breath." She has a one year old - he weighed 3200 g at birth and is very healthy.</p>				
6. The provider repeats back to the patient "that she thinks she is 7 months pregnant and that she tires easily and is short of breath "				
7. The provider says to María Eugenia that they understand that this "worries and frightens her very much".				
8. Has she had this problem before?				
9. Utilizes the HCPB to solicit and record the health history of the pregnant woman				
Asks the following questions:				
10. When was her last birth? (one year ago)				
11. When was her last menstrual period?(30 May)				
12. Calculates the gestational age using today's date (32 weeks)				
13. Estimates the due date correctly (7 March)				
14. Has she had other problems in this pregnancy?				
15. Did she have problems in her previous pregnancy?				
16. Did she have problems during her previous delivery? (prolonged labor- 2 days)				

	Yes	So/so	No	NA
17. Did she have problems after the birth? (postpartum hemorrhage)				
18. Records the information from the visit on the prenatal chart (HCPB)				
Examination of pregnant woman				
19. Explains that she/he is going to examine her				
20. Obtains her consent				
21. Checks weight and height (49 kg and height 1.48 meters)				
22. Takes vital signs (Blood pressure, pulse, temperature) (100/60, 100, 36.1)				
23. Performs a physical exam				
24. Examines the color of her skin and/or her conjunctiva (pale)				
25. Examines her mouth and teeth (pale mucosa)				
26. Performs a breast exam				
27 Examines her heart and lungs (heart rate – 100)				
28. Examines the kidney area (checks for CVA tenderness)				
29 Checks for edema				
Obstetrical exam				
30 Measures the fundal height suitably /correctly (FH is 23 cms – corresponds to 30 weeks gestation) *measured according to CLAP standards/methods				
31 Identifies fetal presentation (cephalic)				
32 Checks fetal heart rate with Pinard fetoscope (144 beats per minute)				
33 Performs a vaginal exam (pelvic exam)				
34 Does a pap smear				
Requests lab tests				
35 Hemoglobin or hematocrit (9 3gm/dl 29%)				
36 Urine exam				
37 VDRL				

	Yes	So/so	No	NA
38. RPR				
39. Blood type (Group and RH)				
40. Glucose				
Identifies problems:				
41. Fundal height (30 weeks) does not correspond with the gestational age				
42. Severe anemia -less than 11gm for 3800 meters (La Paz), less than 9.4gm for 2700 meters (Cochabamba)				
43. Risk of repeat postpartum hemorrhage				
44. Inter-pregnancy interval is less than 2 years				
Plan of care:				
45. Explains to the woman the results of the exam (severe anemia, risk of postpartum hemorrhage, closely spaced pregnancies)				
46. Indicates the due date (March 7)				
47. Indicates fetal well being				
48. Indicates the presentation of baby (cephalic)				
49. Explains to Maria Eugenia the plan of care for the identified problems/risks				
50. Explains dietary measures to treat the anemia (proteins rich in iron, organ meats, dark green vegetables)				
51. Administers iron folate tablets				
52. Indicates the number of iron tablets to take each day (3/day)				
53. Indicates how to take them (with citrus juice not with coffee or tea)				
54. Explains possible side effects (nausea constipation)				
55. General measures at home (rest help in home)				
56. Indicates that she should deliver in the hospital/or health center because of the risk of hemorrhage				
57. Indicates family planning methods to prevent closely spaced pregnancies - these babies are at risk of delivering prematurely and having a low birth weight				

	Yes	So/so	No	NA
58. Offer information on LAM				
59. Offer information on breast feeding				
60. Offer information on STDs				
61. Able to deliver in what ever position they would decide				
62. The husband and/or family can be at the birth				
63. The placenta will be returned to the family				
64. The women will be kept covered and warm during the labor and birth				
65. Indicates tetanus toxoid vaccination				
66. Asks the pregnant woman to repeat the plan of care that the provider just explained				
67. Corrects what the patient said incorrectly				
68. Indicates the day and hour for next visit (2 weeks)				
69. Thanks the pregnant woman for coming to the visit				
70. Completes the information on the prenatal chart (HCPB) correctly				
71. Writes the diagnosis and other findings on additional page				
Labor and delivery				
<p>Marie Eugenia Manriquez arrives at the health center/hospital on foot at 5 o'clock in the morning. She is accompanied by her husband and mother-in-law. She complains that she has had labor pains for 12 hours. Her bag of waters has not broken. She says: "I'm afraid that my labor is going to be long again". She is at 38 weeks gestation. The provider explains and performs an exam. Her contractions are every 3-4 minutes for 20-30 seconds. Her vital signs are BP=110/70, P=88, T=36.2, and FHR=148, cephalic presentation with the head in the first plane. Cervical dilatation is 2 cms.</p>				
72 Registers the information on the HCPB and on the partogram correctly				
Plan of Care				
73 Allow the patient to urinate and move her bowels spontaneously				
74 Allow her to walk around (if membranes are not ruptured)				
75 Allow her to drink fluids				
76 Avoid enemas				
77 Avoid pelvic shaving				

	Yes	So/so	No	NA
78. Allows her husband or family to participate				
Identify/record the risk factors (anemia and history of postpartum hemorrhage) - anticipatory measures for the risks:				
79. Have ready IV fluids to prevent hemorrhagic shock (Ringer's lactate, hemacel or another plasma expander)				
80. Have ready oxytocic medications (oxytocin, methergine)				
81. Look for possible blood donors among the family				
Four hours later you repeat the exam - the cervix has dilated to 4 cms and the membranes are tense. The fetal head is in the first plane and contractions are every 3 minutes lasting 45 seconds. The FHT is 144, BP=120/60, P=100. T=36.1				
82. Registers the patient's data on the partogram correctly				
Two hours later, your exam shows that the cervix is 7 cm dilated. During the exam the membranes rupture and there is clear amniotic fluid. The fetal head is in the second plane, FHT=140 and the contractions are every 2 minutes lasting 60 seconds. The vital signs have not changed. She says that she wants to continue walking. (contraindicated with broken bag of water)				
83. Registers the data on the partogram and construct the alert line correctly.				
What is your plan of care?				
84 Rest on her left side				
One hour later the patient says that she has to move her bowels. Your exam shows she is 10 cm dilated and the head is in the third plane. FHT=152 and the vital signs are normal				
85 Registers the data on the partogram correctly				
Ask What do you want to prepare for the delivery (clothes equipment, environment)?				
86 Warm the clothes for the baby				
87 Warm the delivery room				
88 Prepare the delivery equipment				
Resuscitation of the newborn				
Dona Maria Eugenia is pushing hard and with every contraction, she delivers in a squatting position in 15 minutes. You receive the baby and you see that his cry is weak. His arm and legs move weakly. His hands and feet are blue and his body is pink. He has minimal facial grimacing. The umbilical pulse is 110.				
89 My goodness What are you going to do now? What is the Apgar score at this moment? (Apgar 6)				

	Yes	So/so	No	NA
What should you do now?				
90. Keep the babies head lower than the body to facilitate postural drainage.				
91. Drying/rubbing the baby with a warm dry towel.				
92. Clean out the mouth and nose with gauze or cloth				
93. Use the bulb syringe and make sure the nose and mouth are clear				
94. Recheck the heart rate				
95. Continue to observe the respirations				
Five minutes have passed and you note that the baby is breathing better and his cry is much stronger. His feet and hands are still blue although the body is pink. He is much more active and vigorous. When you suction his mouth with the bulb syringe, he pushes it away. His pulse is 150.				
96. My goodness What is the Apgar score now? (Apgar - 9)				
What should you do now?				
97. Cover him with a dry towel and put him next to his mother or family member - to keep him warm				
Management of postpartum hemorrhage				
Ten minutes later, the placenta delivers spontaneously. Immediately after she starts bleeding heavily with a large amount of bright red blood with clots. You recognize this amount of blood is more than normal. The patient says: "Aay doctor I feel very bad....!":				
Ask What are the most probable causes of hemorrhage?				
98 Uterine atony				
99 Retained placental fragments				
100 Lacerations				
What is your plan of care?				
101 Explain to Maria what is happening and what you are going to do				
102 Massage the uterus and evacuate the clots				
103 Call for help if there is anyone close by				
104 Quickly insert an IV				
105 Begin IV fluids - Ringer's lactate or Normal Saline and run it wide open				
106 Consider two IV's - one in each arm				
107 Takes the pulse and blood pressure				

	Yes	So/so	No	NA
108. Add 40 units of oxytocin to 500 cc of normal saline or if you do not have an IV, inject 20U IM				
109. Give an injection of methergine				
110. Breastfeeding to stimulate uterine contractions				
111. Make sure that the bladder is empty (with Foley catheter)				
112. Inspect the placenta for incomplete cotyledons				
113. Inspect the birth canal and cervix for lacerations and repair them if indicated				
114. Continue to evaluate the patient and explain to her and her family what you are doing to control the hemorrhage				
115. Keep her warm and covered				
116. Put her in Trendelenberg position				
117. Ask for group and RH				
118. Manual exploration of the uterus				
119. Dilation and Curettage if possible				
120. Refer the case for treatment at the next level if necessary				
Maria Eugenia finally is stable - thanks to your fine care. What type of follow-up and counseling would you give to her now?				
121 Explain to Maria what happened				
122. Continue IV fluids until she is able to take po fluids on her own				
123 Continue to massage the fundus				
124 Request lab tests - hemoglobin and hematocrit				
125 Check if she is able to urinate - make sure she gets up with assistance				
126 Prescribe iron folate 3/day				
127 Counsel her on the risk of a repeat hemorrhage with future births and that she should deliver in hospital				

Complication Audit

COD. _____

Describe one case of a maternal or neonatal complication that you last saw.

1. What was the diagnosis?
2. What was the reason for the visit?
3. What actions did you take?
4. Who looked after the case?
5. You solved the problem. How?
6. How did the training help you solve the problem?

Interview of Trained Providers

COD _____

1. Name **3** things included in the training that you think were the most useful:

2. Name **3** things included in the training that you think were the least useful::

3. The training helped to improve team work? **YES** **NO**

Give an example:

Appendix B

Frequency Distribution of Correct Responses to Individual Questions in Knowledge Test by All Providers and Nurse Auxiliaries

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Appendix B
Frequency Distribution of Correct Responses in Knowledge Test

Question number and topic	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
1 Calculate gestational age	94%	82%	0.54	100%	86%	0.41
2 Calculate expected date of delivery	82%	82%	1.00	80%	86%	1.00
3 Expected fundal height at 16 weeks	59%	27%	0.21	50%	29%	0.62
4 Activities @ every prenatal visit	65%	91%	0.19	50%	100%	0.04
7 Identify Septic abortion	77%	82%	1.00	60%	71%	1.00
9 Identify placenta previa	77%	73%	1.00	80%	57%	0.59
10 Management of antepartum hemorrhage	88%	55%	0.08	80%	43%	0.16
11 Management of early labor	65%	27%	0.12	70%	43%	0.35
12 Candidates for partograph	82%	64%	0.38	70%	71%	1.00
13 Management of moderate pre-eclampsia	59%	73%	0.69	70%	57%	0.64
14 Calculate APGAR score	47%	46%	0.76	67%	33%	0.64
16 Management of delivery of third stage of labor	82%	55%	0.20	70%	43%	0.35
17 Identify breech presentation	71%	55%	0.44	60%	57%	1.00
19 Management of breech delivery	12%	0%	0.51	20%	0%	0.49
20 Identify lacerations as cause of postpartum hemorrhage	77%	64%	0.67	70%	57%	0.64
21 Postpartum hemorrhage	77%	64%	.67	70%	57%	.64
22 Identify endometritis	100%	100%	1.00	100%	100%	1.00
23 Measures to maintain newborn temp	100%	91%	0.39	100%	86%	0.41
24 Causes of fetal demise	41%	36%	1.00	60%	29%	0.33
25 Criteria for MELA/LAM	53%	46%	1.00	50%	29%	0.62

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Appendix C

Frequency Distribution of Responses of Feeling Confident in Performing Individual Skill in Level of Confidence Assessment by All Providers and Nurse Auxiliaries

Appendix C							
Frequency Distribution of Responses of Feeling Confident in Performing Skill in Level of Confidence Assessment							
		ALL			Auxiliaries Only		
		TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
Interpersonal communication and counseling (IPC/C)							
1	Comfortable counseling a new mother about breastfeeding	100%	82%	0.15	100%	86%	0.41
2	Comfortable counseling a couple about family planning	94%	82%	0.54	90%	71%	0.54
3	Comfortable counseling a family about need to refer a woman urgently to next level of care	71%	73%	1.00	80%	57%	0.59
4	Comfortable counseling a mother and her family who has just had a stillbirth/neonatal death	53%	73%	0.43	50%	57%	1.00
5	Comfortable counseling a woman who is having side effects from iron/folate tablets	100%	91%	0.39	100%	86%	0.41
6	Comfortable counseling a woman whom you suspect has had an induced abortion	53%	46%	1.00	40%	14%	0.34
Antenatal Care							
1	Obtaining history (medical, social, obstetrical, current pregnancy)	88%	82%	1.00	90%	86%	1.00
2	Calculating gestational age and due date from LMP or other signs of pregnancy	94%	91%	1.00	90%	86%	1.00
3	Performing a general physical examination	71%	91%	0.35	60%	86%	0.34
4	Performing an abdominal examination (fundal height, fetal presentation, fetal heart rate)	77%	100%	0.13	60%	100%	0.10
5	Performing a vaginal examination for sizing uterus	24%	18%	1.00	10%	14%	1.00
6	Identifying size-date discrepancies (uterus is too big or too small for estimate gestational age by dates)	29%	18%	0.67	20%	14%	1.00
7	Identifying a breech or transverse lie in third trimester	65%	73%	1.00	50%	57%	1.00
8	Identifying twins	53%	36%	0.64	50%	29%	0.62
9	Identifying a woman with severe pre-eclampsia	88%	46%	0.03	80%	29%	0.06
10	Knowing what you should do for a woman with severe pre-eclampsia or eclampsia	77%	36%	0.05	70%	14%	0.049
11	Identifying a woman who is anemic from clinical signs	88%	55%	0.08	90%	43%	0.10
12	Knowing what you should do for a woman with severe anemia	88%	36%	0.01	90%	14%	0.004
13	Knowing what you should do for a woman who is less than 28 weeks gestation and has bleeding	71%	46%	0.25	70%	43%	0.35
14	Knowing what you should do for a woman who is 28 weeks or more gestation and has bleeding	47%	36%	0.70	40%	29%	1.00
Intrapartum Care							
1	Monitoring a woman in labor	65%	55%	0.70	70%	57%	0.64

Appendix C

Frequency Distribution of Responses of Feeling Confident in Performing Skill in Level of Confidence Assessment

		ALL			Auxiliaries Only		
		TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
2	Providing care for a woman in labor	100%	91%	0.39	100%	86%	0.41
3	Filling out partograph	29%	9%	0.35	30%	0%	0.23
4	Identifying a woman with abnormal labor	65%	55%	0.70	70%	43%	0.35
5	Managing/monitoring a woman with oxytocin drip for induction or augmentation	53%	18%	0.11	40%	14%	0.34
6	Attending a normal delivery	94%	100%	1.00	100%	100%	1.00
7	Attending a woman delivering in an alternative position (on side squatting etc)	82%	46%	0.09	90%	57%	0.25
8	Attending a woman delivering with a breech	6%	27%	0.27	0%	29%	0.15
9	Attending a woman delivering twins	12%	9%	1.00	10%	0%	1.00
10	Managing a delivery of a baby with shoulder dystocia	0%	18%	0.15	0%	14%	0.41
11	Delivering a placenta	94%	100%	0.82	90%	100%	1.00
12	Identifying perineal tears after delivery	59%	64%	1.00	40%	57%	0.64
13	Repairing an episiotomy or perineal tear	53%	46%	1.00	40%	29%	1.00
14	Estimating blood loss	88%	46%	0.03	80%	29%	0.06
15	Managing a postpartum hemorrhage due to uterine atony	59%	36%	0.44	50%	14%	0.30
16	Performing internal bimanual uterine compression for uterine atony	29%	36%	1.00	40%	29%	1.00
17	Manually removing the placenta	29%	46%	0.44	10%	29%	0.54
18	Managing a woman in shock	47%	36%	0.70	40%	14%	0.34
Newborn Care							
1	Assessing the condition of newborn a deliver to determine need for resuscitation	94%	64%	0.06	90%	57%	0.25
2	Performing neonatal resuscitation	88%	55%	0.08	90%	43%	0.10
3	Providing care to a newborn	94%	91%	1.00	90%	86%	1.00
4	Assisting a mother with breastfeeding	100%	100%	1.00	100%	100%	1.00
5	Determining when a newborn needs referral	94%	64%	0.06	90%	43%	0.10
Postpartum Care							
1	Managing a woman with a postpartum uterine infection (endometritis)	41%	27%	0.69	30%	14%	0.60
2	Managing a woman with a postpartum mastitis	82%	18%	0.001	90%	0%	0.001
3	Determining when a woman needs referral for infection	71%	46%	0.25	60%	43%	0.64

Appendix D

Frequency Distribution of Correct Application of Individual Skills in Skill Assessment/Case Scenario by All Providers and Nurse Auxiliaries

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
Prenatal visit						
1 *Greet her by name and invites her into the consulting room	100%	100%	1 00	100%	100%	1.00
2 *Encourages the participation of the husband or family	71%	100%	0 12	80%	100%	0.49
3 *Receives the pregnant woman in a friendly manner	100%	100%	1 00	100%	100%	1.00
4 *Offers a handshake	77%	27%	0 02	80%	43%	0.16
5 *Provides privacy for the consult	100%	100%	1 00	100%	100%	1.00
6 *Repeats back to the patient that she thinks she is 7 months pregnant and that she tires easily and is short of breath	24%	9%	0 62	0%	0%	1.00
7 *Says to Maria Eugenia that they understand that this "worries and frightens her very much	12%	0%	0 51	0%	0%	1.00
8 *Asks if she has had this problem before?	6%	0%	1 00	0%	0%	1.00
9 Utilizes the HCPB to solicit and record the health history of the pregnant woman	100%	100%	1 00	100%	100%	1.00
10 Asks when was her last birth (one year ago)	100%	100%	1 00	100%	100%	1.00
11 Asks when was her last menstrual period (30 May)	100%	91%	0.39	100%	86%	0.41
12 Calculates the gestational age wheel (31-32 weeks)	53%	64%	0.70	40%	71%	0.02
13 Estimates the due date correctly (7 March)	59%	64%	1 00	40%	71%	0.33
14 Asks has she had other problems in this pregnancy	41%	0%	0.02	30%	0%	0.23
15 Asks did she have problems in her previous pregnancy	24%	0%	0 13	20%	0%	0.49
16 Asks did she have problems during her previous delivery (prolonged labor- 2 days)	41%	27%	0 69	10%	14%	1.00
17 Asks did she have problems after the birth (postpartum hemorrhage)	29%	9%	0.35	10%	0%	1.00
18 Records the information from the visit on the prenatal chart (HCPB)	88%	100%	0.51	80%	100%	0.49
19 *Explains that she/he is going to examine her	71%	64%	1.00	70%	57%	0.64
20 *Obtains her consent	59%	18%	0 054	40%	29%	1.00
21 Checks weight and height (49 kg and height 1 48 meters)	94%	100%	1 00	100%	100%	1.00
22 Takes vital signs (Blood pressure, pulse, temperature) (100/60, 100, 36 1)	100%	100%	1 00	100%	100%	1.00
23 Performs a physical exam	88%	100%	0 51	90%	100%	1.00

*Interpersonal communication and counseling skills
@Anemia prevention and control skills

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
	82%	82%	1 00	80%	86%	1.00
24 @Examines the color of her skin and/or her conjunctiva (pale)	71%	55%	0 44	70%	57%	0.64
25 @Examines her mouth and teeth (pale mucosa)	82%	91%	1.00	80%	86%	1.00
26 Performs a breast exam	35%	27%	1 00	20%	14%	0.49
27 Examines her heart and lungs (heart rate - 100)	24%	9%	0 62	20%	0%	1.00
28 Examines the kidney area (checks for CVA tenderness)	59%	46%	0 76	50%	43%	1.00
29 Checks for edema				30%	29%	1 00
30 Measures the fundal height suitably /correctly (FH is 23 cms - corresponds to 30 weeks gestation - measured according to CLAP standards)	53%	27%	0 25	80%	100%	0.49
31 Identifies fetal presentation (cephalic)	82%	100%	0 26	90%	100%	1 00
32 Checks fetal heart rate with Pinard fetoscope (144 beats per minute)	94%	100%	1 00	40%	0%	0 10
33 Checks fetal heart rate with Pinard fetoscope (144 beats per minute)	53%	0%	0 004	20%	14%	1 00
33 Performs a vaginal exam (pelvic exam)	41%	18%	0 25	70%	14%	0.049
34 Does a pap smear	77%	36%	0 053	70%	43%	0.35
35 @Requests hemoglobin or hematocrit (9 3gm/dl 29%)	71%	46%	0.25	70%	43%	0.35
36 Requests urine exam	24%	27%	1 00	0%	14%	0 41
37 Requests VDRL	18%	9%	1 00	20%	14%	1.00
38 Requests RPR	18%	9%	1 00	70%	43%	0.35
39 Requests blood type (Group and RH)	82%	46%	0 09	10%	0%	1.00
40 Requests glucose	24%	0%	0 13	50%	0%	0.04
41 Recognizes that fundal height (30 weeks) does not correspond with the gestational age	65%	9%	0.006	20%	0%	0.49
42 @Recognizes severe anemia -less than 11gm for 3800 meters (La Paz), less than 9 4gm for 2700 meters (Cochabamba)	41%	18%	0.25	10%	14%	1 00
43 Recognizes the risk of repeat postpartum hemorrhage	35%	18%	0.42	30%	71%	0.15
44 Recognizes the risk of repeat postpartum hemorrhage	59%	64%	1 00	10%	14%	1.00
44 Recognizes that inter-pregnancy interval is less than 2 years	35%	18%	0 42	30%	71%	0.15
45 *@Explains to the woman the results of the exam (severe anemia, risk of postpartum hemorrhage, closely spaced pregnancies)	41%	64%	0.44	40%	57%	0.64
46 Indicates the due date (March 7)	47%	64%	0 64	30%	43%	0 64
47 Indicates fetal well being	47%	46%	0 76			
48. Indicates the presentation of baby (cephalic)						

*Interpersonal communication and counseling skills
@Anemia prevention and control skills

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
49 *Explains to Maria Eugenia the plan of care for the identified problems/risks	47%	9%	0.049	40%	0%	0.10
50 @Explains dietary measures to treat the anemia (proteins rich in iron, organ meats dark green vegetables)	88%	36%	0.01	80%	14%	0.02
51 @Administers iron tablets	41%	0%	0.02	10%	0%	1.00
52 @Indicates the number of iron tablets to take each day (3/day)	24%	0%	0.13	0%	0%	1.00
53 @Indicates how to take them (with citrus juice, not with coffee or tea)	88%	9%	0.001	80%	14%	0.02
54 @Explains possible side effects (nausea constipation)	71%	55%	0.44	60%	57%	1.00
55 Explains general measures at home (rest help in home)	35%	36%	1.00	30%	14%	0.60
56 Indicates that she should deliver in the hospital/or health center because of the risk of hemorrhage	47%	18%	0.23	30%	14%	0.60
57 Indicates family planning methods to prevent closely spaced pregnancies - these babies are at risk of delivering prematurely and having a low birth weight	53%	27%	0.25	60%	29%	0.33
58 Offers information on LAM	24%	18%	1.00	10%	29%	0.54
59 Offers information on breastfeeding	41%	18%	0.25	40%	14%	0.34
60 Offers information on STDs	0%	0%	1.00	0%	0%	1.00

*Interpersonal communication and counseling skills
@Anemia prevention and control skills

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
61 *Explains that she is able to deliver in what ever position she chooses	82%	18%	0.001	90%	14%	0.004
62 *Explains that her husband and/or family can be at the birth	88%	82%	1.00	100%	100%	1.00
63 * Explains that the placenta will be returned to the family	65%	55%	0.70	60%	71%	1.00
64 *Explains that she will be kept covered and warm during the labor and birth	41%	9%	0.099	20%	0%	0.49
65 Indicates tetanus toxoid vaccination	94%	82%	0.54	90%	86%	1.00
66 *Asks the pregnant woman to repeat the plan of care that the provider just explained	0%	0%	1.00	0%	0%	1.00
67 *Corrects what the patient said incorrectly	0%	0%	1.00	0%	0%	1.00
68 Indicates the day and hour for next visit (2 weeks)	100%	91%	0.39	100%	100%	1.00
69 Thanks the pregnant woman for coming to the visit	65%	64%	1.00	90%	57%	0.25
70 Completes the information on the prenatal chart (HCPB) correctly	88%	100%	0.51	80%	100%	0.49
71 Writes the diagnosis and other findings on additional page	12%	0%	0.51	0%	0%	1.00
Labor and delivery						
1 Registers the information on the HCPB and on the partogram correctly	29%	9%	0.35	0%	0%	1.00
2 Allows the patient to urinate and move her bowels spontaneously	35%	18%	0.42	20%	14%	1.00
3 Allows her to walk around (if membranes are not ruptured)	94%	100%	1.00	90%	100%	1.00
4 Allows her to drink fluids	82%	55%	0.20	90%	57%	0.25
5 Avoids enemas	41%	0%	0.02	50%	0%	0.04
6 Avoids pelvic shaving	65%	18%	0.04	70%	29%	0.15
7 Allows her husband or family to participate	88%	100%	0.51	100%	100%	1.00
Anticipatory measures for the risks anemia and history of postpartum hemorrhage	71%	64%	1.00	60%	71%	1.00
8 @Has ready IV fluids to prevent hemorrhagic shock (Ringers lactate, hemacel or another plasma expander)	59%	36%	0.44	40%	29%	1.00
9 @Has ready oxytocic medications (oxytocin, methergine)	6%	18%	0.54	0%	14%	0.41
10 Looks for possible blood donors among the family	29%	9%	0.35	0%	0%	1.00
11 Registers the patient's data on the partogram correctly (+ 4 hrs)	6%	9%	1.00	0%	0%	1.00
12 Registers the data on the partogram and construct the alert line correctly (+ 2 hrs)						

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
13 Asks her to rest on her left side (walking contraindicated with ruptured membranes)	59%	55%	1 00	50%	29%	0.62
14 Registers the data on the partogram correctly (+1 hr)	29%	9%	0 35	0%	0%	1.00
Ask What do you want to prepare for the delivery (clothes, equipment, environment)?	88%	91%	1 00	90%	100%	1.00
15 Warms the clothes for the baby						
16 Warms the delivery room	94%	82%	0 54	90%	86%	1 00
17 Prepares the delivery equipment	77%	100%	0 13	70%	100%	0 23
Resuscitation of the newborn						
1 Calculates 1 minute Apgar score correctly (Apgar -6)	41%	18%	0 25	20%	14%	1 00
2 Keeps the babies head lower than the body to facilitate postural drainage	29%	9%	0 35	40%	0%	0 10
3 Dries/rubs the baby with a warm dry towel	88%	18%	0 001	80%	0%	0.002
4 Cleans out the mouth and nose with gauze or cloth	71%	100%	0 12	60%	100%	0.10
5 Uses the bulb syringe and make sure the nose and mouth are clear	88%	91%	1 00	80%	100%	0.49
6 Rechecks the heart rate	12%	0%	0.51	0%	0%	1 00
7 Continues to observe the respirations	18%	9%	1.00	0%	0%	1.00
8 Calculates 5 minute Apgar score correctly (Apgar -9)	53%	55%	0.76	30%	43%	0 64
9 Covers him/her with a dry towel and puts him/her next to his mother or family member - to keep warm	94%	91%	1.00	90%	86%	1.00
Management of postpartum hemorrhage						
Identifies the most probable causes of hemorrhage?						
1 Uterine atony	41%	18%	0 25	10%	14%	1.00
2 Retained placental fragments	100%	100%	1 00	100%	100%	1.00
3 Lacerations	100%	64%	0.02	100%	57%	0.051
4 *Explains to Maria what is happening and what you are going to do	6%	0%	1 00	0%	0%	1.00
5 Massages the uterus and evacuates the clots	77%	36%	0.05	70%	29%	0.15
6 Calls for help if there is anyone close by	12%	0%	0.51	0%	0%	1.00
7 Quickly inserts an IV	82%	55%	0 20	70%	71%	1.00

Appendix D
Frequency Distribution of Correct Application of Skills in Skill Assessment

	ALL PROVIDERS			AUXILIARIES ONLY		
	TRAINED N=17	UNTRAINED N=11	P value	TRAINED N=10	UNTRAINED N=7	P value
8 Begins IV fluids - Ringer's lactate or Normal Saline - and runs it wide open	77%	55%	0.41	70%	71%	1.00
9 Considers two IVs - one in each arm	0%	0%	1.00	0%	0%	1.00
10 Takes the pulse and blood pressure	88%	18%	0.001	80%	14%	0.02
11 Adds 40 units of oxytocin to 500 cc of normal saline or if you do not have an IV injects 20U IM	35%	0%	0.05	30%	0%	0.23
12 Gives an injection of methergine	88%	82%	1.00	90%	86%	1.00
13 Encourages her to breast feed to stimulate uterine contractions	59%	64%	1.00	70%	86%	0.60
14 Makes sure that the bladder is empty (with Foley catheter)	0%	0%	1.00	0%	0%	1.00
15 Inspects the placenta for incomplete cotyledons	94%	100%	1.00	90%	100%	1.00
16 Inspects the birth canal and cervix for lacerations and repair them if indicated	100%	73%	0.05	100%	71%	0.15
17 *Continues to evaluate the patient and explain to her and her family what you are doing to control the hemorrhage	18%	0%	0.26	30%	0%	1.00
18 Keeps her warm and covered	35%	18%	0.42	10%	0%	1.00
19 Puts her in Trendelenberg position	59%	18%	0.05	50%	14%	0.30
20 Asks for group and RH	6%	9%	1.00	0%	14%	0.41
21 Manually explores of the uterus	47%	64%	0.64	10%	57%	0.10
22 Considers a dilatation and curettage if necessary and possible	29%	0%	0.12	20%	0%	1.00
23 Refers the case for treatment at the next level if necessary	53%	82%	0.23	50%	100%	0.04
24 *Explains to Maria what happened	53%	0%	0.004	50%	0%	0.04
25 Continues IV fluids until she is able to take po fluids on her own	35%	27%	1.00	20%	29%	1.00
26 Continues to massage the fundus	41%	9%	0.099	20%	14%	1.00
27 Requests lab tests - hemoglobin and hematocrit	18%	0%	0.26	10%	0%	1.00
28 Check if she is able to urinate - make sure she gets up with assistance	0%	0%	1.00	0%	0%	1.00
29 @Prescribes iron folate 3/day	47%	9%	0.049	30%	14%	0.60
30 Counsels her on the risk of a repeat hemorrhage with future births and that she should deliver in hospital	12%	27%	0.35	0%	14%	0.41

Appendix E

Complication Audit

Complications Managed By Trained Providers

- Two occurrences of premature labor and births between 28 to 30 weeks. Both mothers presented to the health center ready to deliver: the first was a fetal demise; the second was a breech presentation with resultant head entrapment and fetal demise.
- Fetal demise at 30 weeks diagnosed at first prenatal visit by physical exam and sonogram. Patient was referred to level II for care.
- Term fetal demise (with possible maternal history of diabetes). The mother presented to the clinic with a five-day history of vaginal bleeding, fever, and absence of fetal movement. Patient was evaluated and referred to La Paz.
- Post-dates pregnancy of 48 weeks (?) calculated by last menstrual period. The patient was referred to the level II facility for care. This nurse auxiliary felt that she was able to assess/identify a post-date pregnancy and transfer appropriately due to the knowledge she received from the course.
- Two Pre-eclamptic at term with appropriate referral to a level II facility.
- Eclamptic with fetal demise was transferred from home to a health center by a nurse auxiliary. When the patient arrived seizing, she was given IV Valium, a bolus of Magnesium Sulfate and referred to La Paz for care. The physician who cared for this woman felt the course assisted her to manage the patient appropriately and provided her with the skills to make a timely referral to La Paz.
- Prolonged labor due to face to mentum presentation. The patient was transferred to a level II facility and delivered by cesarean section.
- Prolonged labor at home (48 hours) The patient presented to the health center for care and received oxytocin augmentation of labor with a resultant spontaneous vaginal birth. The nurse auxiliary felt that she was able to contribute ideas to the management of this patient's care to the physician who was attending the labor/birth. The suggestions were welcomed and incorporated into the care.
- Prolonged second stage of labor. Patient was transferred and delivered by cesarean section with a diagnosis of cephalo—pelvic disproportion.
- Vaginal breech attended by the physician.
- Severe postpartum hemorrhage with resultant maternal death (grand multipara - para 10 with history of three previous postpartum hemorrhages). Patient received one late prenatal care visit at home and was transferred from home to the health center for labor and birth. Multiple efforts were made to stop the bleeding and the decision to transfer to La Paz was initiated (2 hours away) but there was no gas in the ambulance or other manner of transport. The two physicians and nurse were able to finally stop the bleeding but the hypovolemia was too severe and the patient died. The nurse who was interviewed felt that the course had helped with her decision-making and management of the severe hemorrhage. Sadly, lack of transport was the prime factor in this maternal death.
- Postpartum hemorrhage due to retained placental parts. The patient was attended by the nurse auxiliary at home, the placenta was delivered in fragments with a resultant hemorrhage. Intravenous fluid with oxytocin was started and transfer was initiated to the health center. The

community provided transportation. A manual removal of the placental pieces was done by the physician with resolution of the bleeding. The nurse auxiliary who attended this birth felt the course helped her identify the hemorrhage and reason for the blood loss and refer to the next level of care in an efficient manner.

- Postpartum hemorrhage (cause unknown) following a home birth. The nurse auxiliary placed an intravenous, gave methergine, put the patient in Trendelenberg position, and kept her warm. She was transferred to the health center where the physician did a manual removal of placental fragments. This nurse auxiliary felt that the course helped her to recognize and better manage the hemorrhage. When the patient was transferred to the hospital, the nurse auxiliary was incorporated as part of the medical team in resolving the hemorrhage.
- Postpartum hemorrhage with resultant hysterectomy at 38 weeks. The patient was a planned C-section due to macrosomia, she presented to the hospital with vaginal bleeding (probable abruption), and bradycardia. Emergency surgery was done, but they were unable to control the bleeding. The physicians said they found multiple “varicosities in the uterus.” Immediately postpartum the patient’s hemoglobin was 6 grams, and she received six units of blood. At the two-week postpartum evaluation, both mother and baby were doing well.

Complications managed by untrained providers

- Three eclamptic mothers with transfer to level II or III facilities.
- Breech birth at home with head entrapment—following two hours of neonatal resuscitation, the newborn died.
- Twin birth at health center attended by the physician and nurse auxiliary. The first baby was cephalic and delivered alive, and the second was a hand presentation with resultant fetal demise at term
- Two transverse lies with transfer to a level II facility and delivered by C-section.
- Fetal demise at 28 weeks—mother was transferred to a level II facility for induction.