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## Improving Compliance with Standards for Essential Obstetric Care in Bolivia

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Center for Human Services • 7200 Wisconsin Avenue, Suite 600 • Bethesda, MD 20814-4811 • USA





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TEL (301) 654-8338

FAX (301) 941-8427

[www.qaproject.org](http://www.qaproject.org)

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## About this series

**The Case Study series** presents real applications of quality assurance (QA) methods in developing countries at various health system levels, from national to community. The series focuses on QA applications in child survival, maternal and reproductive health, and infectious diseases. Each case study focuses on a major QA activity area, such as quality design, quality improvement, communication and development of standards, or quality assessment. In some cases, more than one QA activity is presented.

Quality improvement is a systematic process of addressing the gaps between current practices and desired standards. Effective approaches to quality improvement include individual problem solving, rapid team problem solving, systematic team problem solving, and process improvement. These methods vary in the time and resources required and the number of people who participate. Regardless of the rigor and intensity of the method used, quality improvement approaches usually share four basic steps: identification of opportunity for quality improvement, analysis of improvement area, development of possible interventions to address a need for improvement, and testing and implementing interventions. Sometimes, when the potential solutions to a problem are clearly defined, a shorter quality improvement activity focused on testing the alternatives is used.

**This case study** illustrates how the quality improvement methodology—specifically rapid team problem solving—can be used to target areas for improvement and produce rapid, yet dramatic, improvements.

## Acknowledgements

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## Improving Compliance with Standards for Essential Obstetric Care in Bolivia

### Background

An estimated 370 women die in Bolivia from pregnancy-related causes for every 100,000 live births.<sup>a</sup> This maternal mortality rate is one of the highest in Latin America and more than double the regional average of 162 maternal deaths per 100,000 births. Maternal deaths stem not only from a lack of knowledge about obstetric danger signs and complications, and difficult accessibility to essential obstetric care (EOC),<sup>1</sup> but also from the inability of healthcare providers to detect and manage obstetric complications.



The Quality Assurance (QA) Project partners with the Pan American Health Organization (PAHO) in the Latin American and Caribbean Regional Initiative to Reduce Maternal Mortality (LAMM) to address knowledge of obstetric danger

<sup>1</sup> EOC includes the detection and management of problem pregnancies (e.g., severe anemia, diabetes, etc.), medical treatment of complications (hemorrhage, sepsis, shock, eclampsia, anemia, etc.), monitoring labor (including partograph), neonatal special care, manual procedures (e.g., removal of placenta, episiotomy repair, etc.), surgical interventions, anesthesia, and blood replacement.

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## Abbreviations

EOC	Essential Obstetric Care
JSI	John Snow, Inc.
LAMM	Latin American and Caribbean Regional Initiative to Reduce Maternal Mortality
MOH	Ministry of Health
PAHO	Pan American Health Organization
QA	Quality assurance
QI	Quality improvement
SEDES	Servicio Departamental de Salud—Santa Cruz (Santa Cruz Health Department)
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development

signs and access to EOC at the community level, while also improving the ability to detect and manage obstetric complications in health facilities. Funded by the United States Agency for International Development (USAID), LAMM has provided technical assistance to the Ministries of Health (MOH) of Bolivia, Ecuador, and Honduras since 1997 with the dual objective of reducing national levels of maternal mortality and developing a model—to be replicated in the Latin America and Caribbean region—to reduce maternal mortality.

The QA Project initiated technical assistance to three hospitals and one health center in the district of Ichilo, Bolivia, in 2000 with the objective of improving the ability of healthcare providers and facilities to detect and manage obstetric complications. One way to improve the quality of EOC is to initiate quality improvement (QI) teams in each health facility to improve prenatal, labor, and delivery care, important components of EOC. Six multidisciplinary QI teams (Table 1) were formed in August of 2000 after a workshop that introduced participants to the concepts of quality assurance. This case study highlights the experi-

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ences and results of the labor and delivery teams at the hospitals.<sup>2</sup>

**Table 1. Quality Improvement Teams (Ichilo, Bolivia)**

Hospital	Component of EOC for Improvement
Yapacani Hospital / Team 1	Labor and delivery
Buena Vista Hospital / Team 1	Prenatal care
Buena Vista Hospital / Team 2	Labor and delivery
San Carlos Hospital / Team 1	Prenatal care
San Carlos Hospital / Team 2	Labor and delivery
Jampicuna Health Center / Team 1	Prenatal care

With the specific objective of improving the quality of maternal care, teams focused on improving processes either for prenatal care or for labor and delivery. These teams generally included physicians, nurses, auxiliary nurses, laboratory technicians, statisticians, administrators, and when possible, an obstetrician and pediatrician.<sup>3</sup>

Guidance was provided by several individuals. The hospital directors frequently participated in QI activities and closely followed the teams' achievements. In addition, a local QA Project field coordinator, trained by the QA Project to provide technical assistance during these quality assurance activities, provided continued support to the teams. Lastly, four facilitators from the Santa Cruz Health Department (SEDES) provided guidance. The facilitators were physicians or nurses and were selected for their

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<sup>2</sup> The main differences between the health center and the hospitals is that hospitals are open 24 hours per day, are equipped to provide emergency obstetrical care, and are covered by social security. Because of these characteristics each hospital delivers more babies than the health center.

<sup>3</sup> San Carlos hospital is the only facility that, at this writing, has an obstetrician and pediatrician, as it is a referral hospital for obstetric complications.



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technical knowledge and leadership skills. The LAMM field coordinator had trained the facilitators in the application of the QI methodology, which was new to the Ichilo district, and mentored the facilitators during the QA activities.



It is important to note that these QI efforts took place in the midst of health sector reform. The national health system has been highly decentralized since 1994 when the Popular Participation Act transferred responsibility for infrastructure,

financial resources, maintenance, and administration to municipalities.<sup>3</sup> Next, the Administrative Decentralization Act transferred the administration of human resources to each department.<sup>4</sup> Bolivia then sought to improve access to healthcare for pregnant women and children under the age of five by creating a national insurance system. Since 1996 this system has provided universal coverage for all pregnant women and all children under the age of five. It covers ambulatory care, medical assistance, medical attention for pregnancy, delivery, postpartum care, obstetric emergencies, pharmaceuticals, and hospitalization for acute diarrhea and pneumonia.

The success of the QI methodology depends on the active participation of personnel and community members to create change to improve the quality of care and to mobilize local resources to implement those changes. Bolivia's highly decentralized healthcare system—particularly for maternal and child health—created a responsive environment for quality improvement in EOC services. In general, Ichilo's QI teams received only technical assistance from the QA Project; the improvements they made were usually low cost or no cost. This aspect of the QA Project's technical assistance contributes to the low cost of this model and the sustainability of quality assurance activities.

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<sup>4</sup> Bolivia is divided into nine departments consisting of districts and municipalities.

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## Quality Improvement Methods

The Ichilo QI teams had the specific objective of monitoring and improving compliance with clinical and administrative standards.<sup>5</sup> The emphasis on compliance with standards aimed to reinforce the EOC skills training that LAMM had provided to nearly every healthcare provider in the district. Each QI team began by agreeing to focus on the standards in Table 2.

**Table 2. Standards of Care for Labor and Delivery (All Labor and Delivery Teams, Ichilo)**

Standard	Significance of the Standard
All women in labor and delivery will be monitored with a partograph.	The partograph is a graphic instrument used by healthcare providers to monitor progress in labor and to assess and record the condition of the mother and fetus. It is effective for early detection of prolonged labor.
All women in labor and delivery will have laboratory exams for hemoglobin, blood type, Rh factor, and syphilis.	These laboratory tests are critical to the quality of care during labor and delivery. The testing of hemoglobin can detect anemia; tests for the blood type and Rh factor are necessary in case a blood transfusion is needed; and tests for syphilis are critical to the health of the mother and newborn.
Every woman will be examined every 30 minutes for the first 2 hours after delivery for vital signs, bleeding, and uterine status.	Some of the most serious and life-threatening complications, such as hemorrhage or sepsis, occur during the postpartum period of 2 hours after delivery. In order to detect complications in a timely manner, it is important to standardize what must be monitored and when.
All women in delivery will have a protocol of care clearly documented.	A protocol of care is a plan, or set of steps to follow, in the management of a specific patient. <sup>c</sup> It is critical for documenting the care provided to each patient and planning for any follow-up procedures or actions (e.g., how often to assess the patient, what to assess, what treatments or procedures may be necessary).

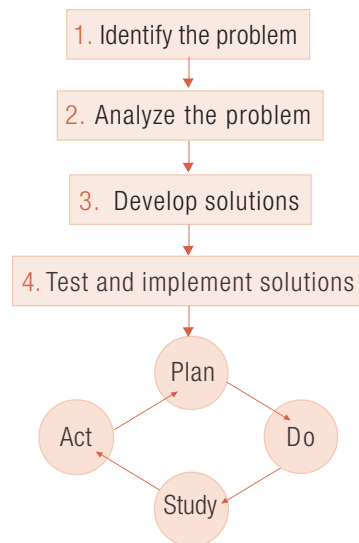
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<sup>5</sup> A standard is an expectation of quality that is explicit (written) or implicit (understood). Explicit standards appear in a variety of forms (e.g., specifications, protocols, procedures) and may be developed by a number of different organizations such as Ministries of Health, professional organizations, accrediting organizations, or by a team of workers in a healthcare system. See also Ashton 2001 in the endnotes.

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Problems (also called “opportunities for improvement”) differ in a number of aspects, such as the complexity of the problem, the amount of existing data available on the problem, and the level of insight and knowledge team members have about the problem.<sup>d</sup> The QA Project responds to this variation by identifying four different approaches to improving quality. Each approach (individual problem solving, rapid team problem solving, systematic team problem solving, and process improvement) follows the steps in Figure 1.

**Figure 1. Steps to Quality Improvement**



The LAMM field coordinator recommended rapid team problem solving for the Ichilo teams. In this approach, a QI team studies a healthcare system and then develops, tests, and implements a series of small, incremental changes to the system or its components. This approach is “rapid” because it is used when team members have insight into the causes of and potential solutions to the problem. (Having these insights minimizes the need for data collection to determine the root cause[s] of the problem.) This approach was appropriate for the teams in Ichilo as the team members had insights into the potential causes of the

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problems selected and wanted to achieve rapid, initial results. In fact, the Ichilo teams began to achieve results within a month or two. It is important to note, however, that the teams could successfully apply rapid team problem solving because they received ongoing support and guidance from the facilitators, MOH district and provincial supervisors, and the QA Project.



After each team identified the opportunities for improvement it would address, the facilitators helped them decide which opportunities could be addressed by management action and which were sufficiently complex to require team problem solving (see “Selecting Solutions” below in Step 3). This division of work allowed the teams to focus on the most complex issues. Management action generally yielded dramatic and sustained results; however, when teams were not satisfied with the results from management action, they revisited the problem and addressed it using rapid team problem solving.

### **Step One: Identify the Problem**

Problems, or opportunities for improvement, become apparent in several different ways. For instance, an adverse event may occur, a client or someone on the staff may notice that something should be better, or an external evaluation may uncover a problem that staff had overlooked or felt unable to correct. In Ichilo, opportunities for improvement were identified in the context of poor compliance with certain standards. The hospitals intentionally assessed quality by identifying standards staff thought should be improved, measuring compliance with the standards, and assessing whether compliance was acceptable. Therefore, the teams in Ichilo identified opportunities for improvement by selecting standards, developing key indicators, and setting baselines for those indicators.

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**Selecting key standards.** The QI teams reviewed Bolivian MOH standards for EOC<sup>6</sup> and selected key technical standards (e.g., postpartum monitoring and use of the partograph) and administrative standards (e.g., the accurate completion of clinical records).

The teams also developed standards that had not been promulgated by the MOH. They identified what they believed were the most important quality issues for their communities and developed standards for those issues. For example, the Buena Vista team felt that personalizing the care of women during labor and delivery was important to their community, so they developed standards to give each woman the options of choosing her position for delivery and permitting a family member to accompany her during delivery. Developing and implementing standards outside the MOH's purview demonstrated the teams' ability to improve services from the clients' perspective.

Although each team worked independently, all three labor and delivery teams selected the four standards in Table 2 from the MOH publication.<sup>6</sup> These four standards comprise most of the discussion in this case study; some descriptions of the standards each team conceived to meet community expectations are also included.

**Developing and measuring key indicators.** The teams developed indicators to measure the level of compliance for each of the selected standards. Next, each team determined the baseline of each indicator. To determine the baseline, one or two team members and the QA Project facilitator reviewed the medical records for all women who delivered at the hospital over the previous three months. This review took approximately one month and was completed in stages. Ypacani Hospital began first and finished in August 2000. Buena Vista and San Carlos Hospitals began next and finished in October 2000. This effort provided information about the actual level of compliance with each standard and highlighted the difference between actual and perfect compliance (Table 3).

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<sup>6</sup> The Bolivian MOH developed and published these standards in "*Atención a la Mujer y Recién Nacido*" with the technical assistance of MotherCare (JSI, UNICEF, and PAHO).

**Table 3. Standards, Indicators, and Baseline Data (All Labor and Delivery Teams)**

Standard	Indicator	Yapacani N=124 Aug. 2000	Buena Vista N=49 Oct. 2000	San Carlos N=52 Oct. 2000
All women in labor and delivery will be monitored with a partograph.	Percentage of deliveries correctly monitored with a partograph	0%	24%	12%
All women in labor and delivery will have laboratory exams for hemoglobin, blood type, Rh factor, and syphilis.	Percentage of attended deliveries with laboratory exams for hemoglobin, blood type, Rh factor, and syphilis	33%	83%	7%
Every woman will be examined every 30 minutes for the first 2 hours after delivery for vital signs, bleeding, and uterine status.	Percentage of women monitored for vital signs, bleeding, and uterine status every 30 minutes for the first 2 hours after delivery	0%	24%	16%
All women in delivery will have a protocol of care that is clearly documented.	Percentage of women who deliver and have a protocol of care	8%	83%	77%

An indicator is satisfied only if compliance is complete. For example, the indicator for laboratory testing would not be met if the healthcare provider tested for blood type but not syphilis. Likewise, the postpartum monitoring standard is satisfied only if the provider completed and recorded the entire regimen every 30 minutes for the first two hours after delivery.

**Defining the problems.** The baseline data provided the necessary information to define compliance problems. Examples of these definitions (in terms of compliance with each standard) are in Table 4.

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**Table 4. Examples of Definitions of Identified Problems**

Buena Vista Hospital	76% of women in labor and delivery are not monitored with a partograph.
San Carlos Hospital	93% of women in labor do not have laboratory exams for hemoglobin, blood type, Rh group, and syphilis.
Yapacani Hospital	100% of women in immediate postpartum care are not strictly monitored for vital signs, bleeding, and uterine status every 30 minutes for the first 2 hours after delivery.

**Selecting an approach to quality improvement.**

Because the teams elected to address all the problems identified, the QA Project facilitator helped them to determine which could probably be addressed by management action and which warranted team problem solving. When teams elected management action, the hospital director took responsibility for improving compliance. The Yapacani and San Carlos teams chose management action for the partograph-monitoring standard, and the Buena Vista team chose this method for postpartum monitoring.

**Assuming Ownership of the Results**

Initially, the team members were disappointed with their baseline measurements, and some of them blamed others. The team facilitators met with each team to discuss the fact that everyone was responsible for the results and that if they worked together to apply the QI methodology, these problems could be overcome. Based on this discussion, team members assumed ownership of the baseline measurements and elected to address all of the problem areas.

The facilitator explained to the teams that if management action did not solve a problem, rapid team problem solving would be necessary. Indeed, some teams did find that management action did not satisfactorily solve a problem, so they revisited it. (Details are in “Act on the Results” below.)

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## Step Two: Analyze the Problem

During the “analyze” step, a team considers what it needs to know or understand about a problem before proposing solutions. During this step, team members ask: Who is involved or affected by the problem? Where and when does the problem occur? What happens when the problem occurs? Why does the problem occur? Rapid team problem solving emphasizes using existing data and brainstorming among team members to understand the problem. The teams drew on their collective knowledge of the labor and delivery processes to draw flowcharts and brainstorm about possible problem causes. The following example from Yapacani exemplifies how the teams performed problem analysis.

**Analyzing processes.** A *high-level flowchart* shows the major steps in a process, providing a basic picture of the process and indicating where each member of the healthcare team participates. It helps people understand the processes within a system. By drawing high-level flowcharts of each system that ended in an undesirable result, the teams could see where the problems originated.

For example, to fully understand the process for immediate postpartum care as it was being performed at Yapacani, the labor and delivery team drew the flowchart in Figure 2. As noted above, this standard assures the timely detection of any postpartum complications by monitoring, for the first two hours after delivery, for vital signs,

### Building Multidisciplinary Teams

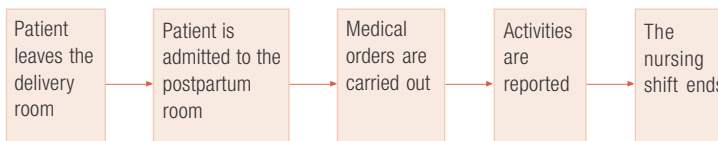
When the labor and delivery teams at Yapacani and Buena Vista drew a high-level flowchart of the process for taking laboratory exams of women in labor, they realized that the laboratory technicians could help them understand the process and propose potential solutions. The teams invited these technicians to participate in the QI teamwork. The technicians became active team members and also contributed to the development and implementation of solutions in other areas. For example, a Yapacani technician now conducts monthly client satisfaction surveys to assess the information patients receive about respiratory breathing and positioning during labor and delivery.



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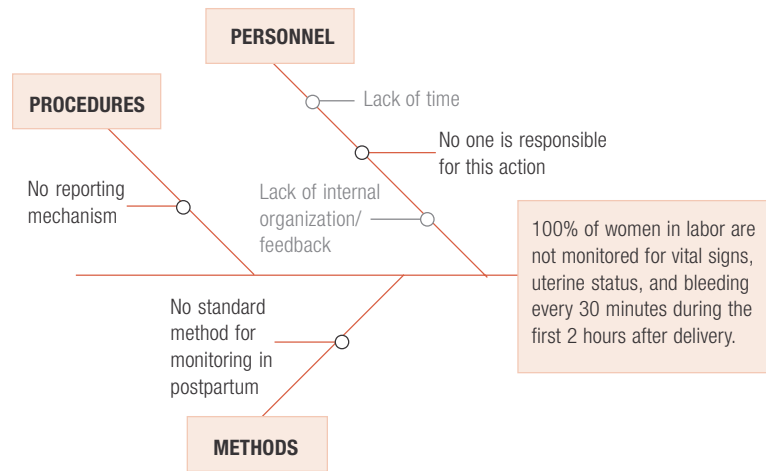
uterine status, and bleeding. The team needed to understand why this monitoring was not occurring. In discussing the process for this care and devising the flowchart, the team members noticed a lack of continuity of care between nursing shifts. The flowchart showed the team that the existing process for immediate postpartum care did not have a system to assure continuous monitoring of patients across two nurses' shifts.

**Figure 2. Flowchart of the Monitoring Process during Immediate Postpartum Care (Labor and Delivery Team, Yapacani Hospital)**



**Hypothesizing about causes of the problem.** A cause-and-effect analysis helps teams see links between problems and their potential causes. The *fishbone diagram* is one type of cause-and-effect analysis; it helps teams to brainstorm about possible causes of a problem and to group those causes into categories. The Yapacani team developed the fishbone diagram in Figure 3 to understand and hypothesize (i.e., make tentative assumptions about) the underlying causes contributing to the lack of monitoring during immediate postpartum care. That is, the team hypothesized causes that would answer the question, Why does monitoring stop when the nursing shift ends? The hypothesized causes were grouped into three categories: procedures, personnel, and methods. The lack of standardization in monitoring and reporting key information about postpartum patients cut across all three categories (see bold text in Figure 3). It is important to note that although this diagram helped the team members collect and organize their collective insights about potential causes of the problem, it did not prove or single out a primary cause: certainty of causes requires quantitative data.

**Figure 3. Fishbone Diagram of Hypothesized Causes for Lack of Monitoring during Immediate Postpartum Care (Yapacani Hospital)**



Analysis tools like the flowchart and fishbone diagram helped the teams to understand the processes and possible causes for the identified problems.

### Step Three: Develop Solutions

The third step, “develop solutions,” uses information from the previous step to formulate hypotheses about what solutions would likely reduce or eliminate the problem and in turn improve the quality of care. Having identified and analyzed possible causes of the problems, the teams had ample information for developing hypotheses about solutions. Reflecting on the causes they had hypothesized in Step 2, they tried to identify solutions that might be linked to those causes. They hypothesized about what would reduce the problem or make it stop occurring: a proposed solution. Proposed solutions remain theoretical until they have been tested and have demonstrated improvement (as shown in the next step). Since rapid team problem solving supports the development of many small, incremental solutions that the team develops to gradually reduce a problem, it was anticipated that more than one solution

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might be proposed for each problem and that solutions might be implemented one at a time, with each tested to measure its impact.

**Brainstorming to develop solutions.** Using the information related to the causes of each problem, the teams generated a list of solutions for each problem using brainstorming. Brainstorming is an activity where a group of people (individuals can do it, but having more people generates more ideas) raise ideas without evaluating whether the ideas are good or not. This process taps into group knowledge and creativity in a forum where ideas are freely generated. Once several ideas have been expressed and recorded, the group discusses them, elaborates on them, combines them, and prioritizes them.

**Selecting solutions.** After the teams had developed a list of potential solutions, the facilitator and team discussed the advantages, disadvantages, and feasibility of each. This discussion helped the teams to select solutions that balanced feasibility and the likelihood of reducing the problem. For example, the team at Buena Vista hypothesized that one reason why women in labor did not receive laboratory exams was because the laboratory technician was off duty (e.g., holidays and weekends). The team members generated a number of solutions to address this issue, such as calling the technician to the hospital when a test was needed, hiring another technician, and training nurses to conduct these tests. After discussing the advantages and disadvantages of each proposed solution, the team selected<sup>7</sup> training nurses as the most viable, since calling in the off-duty technician was not favorable and budget restrictions precluded hiring another. Table 5 summarizes the information gathered thus far in the QI process.

Table 5 shows that although the labor and monitoring teams addressed many of the same problems, many

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<sup>7</sup> Various prioritizing tools, such as voting, may be used to reach agreement on which proposed solution will be tested first; see Massoud et al. 2001 (endnotes), p. 54-58.

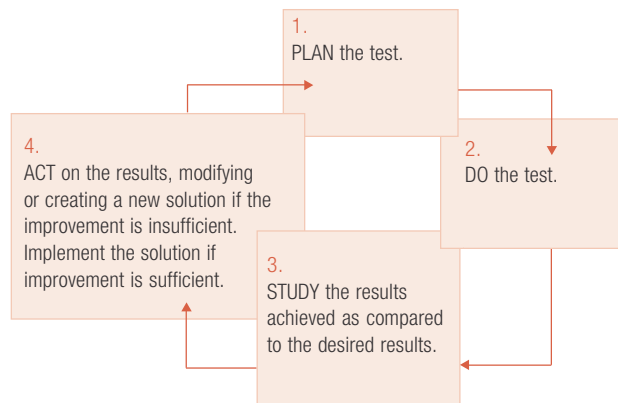
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different solutions were proposed. This variety helped teams learn from each other's experiences as well as adapt and implement each other's solutions.

### Step Four: Test and Implement Solutions

This final QI step tests the proposed solutions to determine whether they yield sufficient improvement. In rapid team problem solving, a number of solutions can be incrementally developed, tested, and, if proven effective, implemented into the system. Solutions are tested using the Plan, Do, Study, Act Cycle (PDSA or Shewhart's Cycle for Learning and Improvement)<sup>f</sup> shown in Figure 4.

**Figure 4. PDSA Cycle to Test Solutions**



**Planning the test.** At this stage the QI teams had a comprehensive list of possible solutions and had to organize all the activities and resources that would have to be in place to test these solutions. Each team created a table that identified: (a) the activities, (b) the human and material resources needed for completing the activities, (c) the individual(s) responsible for performing the activities, and (d) the timetable for performing and completing activities. The tables served as graphic displays for their plan for testing solutions (Table 6 is an example). Even after successfully carrying out the plan, the teams continue to monitor compliance with standards, develop solutions to

**Table 5. Information Gathered in Steps 1 through 3 (All Labor and Delivery Teams)**

Identified Problem	Method	Hypothesized Cause(s)	Proposed Solutions
<b>Yapacani Hospital</b>			
Laboratory exams	Team problem solving	Personnel do not know how to conduct the laboratory exams.  Exams are not done on weekends and holidays when the laboratory technician is off duty.  No system exists for requesting laboratory testing supplies.	Provide practical and theoretical training in laboratory testing.  Create a system to request laboratory supplies every three months.
Postpartum monitoring	Team problem solving	No systematic way exists to monitor key areas in immediate postpartum.  Staff do not know how and when to monitor postpartum patients.	Create a rotation staff schedule so that staff are always present to monitor key areas.  Train staff in monitoring patients. Create a reporting system to include immediate postpartum monitoring in the clinical record.
Protocols	Management action	Communication is lacking about management's expectations for staff in complying with the protocols.	Communicate the baseline results to all personnel and outline expectations for improvement.

Identified Problem	Method	Hypothesized Cause(s)	Proposed Solutions
<b>Buena Vista Hospital</b>			
Monitoring labor with a partograph	Team problem solving	Personnel require reinforcement and practice in their skills to monitor labor with a partograph.	Present a one-day reinforcement course for all nurses and physicians.
Postpartum monitoring	Management action	Communication is lacking about management's expectations for staff in complying with the protocols.	Communicate the baseline results to all personnel and outline expectations for improvement.
Protocols	Management action	Communication is lacking about management's expectations for staff in complying with the protocols.	Communicate the baseline results to all personnel and outline expectations for improvement.
<b>San Carlos Hospital</b>			
Laboratory testing	Team problem solving	Personnel require reinforcement and practice in conducting laboratory exams.	Inform all personnel that these laboratory tests for women in labor and delivery are a standard of care. Present a half-day practical training in conducting laboratory exams.
Monitoring labor with a partograph	Management action	Communication is lacking about management's expectations for staff in complying with the protocols.	Communicate the baseline results to all personnel and outline expectations for improvement.
Protocols	Management action	Communication is lacking about management's expectations for staff in complying with the protocols.	Communicate the baseline results to all personnel and outline expectations for improvement.

yield further improvements, and incrementally test and implement those solutions.

**Table 6. A Sample Plan to Test Solutions (Labor and Delivery QI Team, San Carlos Hospital)**

Activity	Human Resources	Material Resources	Responsible Individual(s)	Timeline (Weeks)					
Conduct a half-day training in the use of the partograph.	General physicians Obstetrician Nurses	Partographs	General physicians Obstetrician Facilitator	1	2	3	4	5	6
Create a rotating schedule of staff for immediate postpartum monitoring.	Obstetrician Nurses	Supplies necessary to conduct the monitoring	Head of nursing Supervisor of nursing		X				
Create a reporting sheet that will be included in the medical record.	Nurses	Reporting sheets	Head of nursing Supervisor of nursing			X			
Request a blood pressure gauge.	District director	Paper for the letter	Hospital director				X		

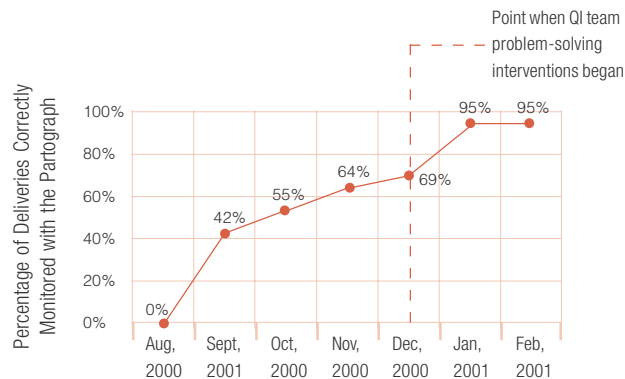
**Doing the test.** The teams then carried out the tests, using their plans as guides. The tables helped the teams remember who was responsible for each activity and to maintain accountability for its implementation. If the plans or activities changed, the teams documented the changes so that successful interventions could be precisely replicated and/or expanded and ineffective changes could be modified in the implementation of the intervention.

**Studying the results.** Allowing time for change to occur is important because the interventions—even if effective—may not show immediate results. Each month for several months, the QA Project facilitator and a team member would review all medical records related to deliveries to compile data for each indicator. Changes in the indicators showed the effect of each set of interventions. At Yapacani, an average of 40 (ranging from 33 to 48) records was reviewed each month from August 2000 to February 2001; at Buena Vista, an average of 15 (ranging from 10 to 19)

records was reviewed each month from October 2000 to February 2001; and at San Carlos, an average of 12 (from 8 to 23) records was reviewed from October 2000 to February 2001. The monitoring of the indicators would reveal which interventions were successful and which required further modification.

**Acting on the results.** The teams met monthly to review the results as the activities continued and increasingly caused improvements. Most of the interventions yielded so much improvement that the teams decided to implement them permanently (see “Results”). In addition, some were also implemented in other hospitals, and some were adopted at the district level.

**Figure 5. Partograph Use to Monitor Labor and Delivery (Yapacani Hospital)**



Sometimes, however, the team members felt that the improvement was unsatisfactory. In these cases, the teams would re-analyze the problem, modify interventions or develop new ones, and then re-evaluate the results.

For example, the team at Yapacani studied the results of the management action to improve compliance with the use of the partograph. Although partograph use increased from 0 percent to 69 percent in five months (Figure 5), the team felt that this improvement was not sufficient, as the results indicated that 31 percent of deliveries were still not monitored with the partograph. The team believed that further management action would not yield more improve-



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ment and therefore returned to analyze the problem as a team. The team brainstormed potential causes of the problems and agreed to focus on two: (a) a lack of confidence among personnel in their ability to fill out the partograph correctly, and (b) the fact that the hospital often ran out of partograph worksheets. The team proposed solutions to address these causes: training healthcare providers on how to use the partograph, providing orientation on its importance, and requesting more partograph worksheets from the mayor. These solutions increased compliance from 69 percent to 95 percent in one month (Figure 5). This example illustrates that QI is a continual process where team members continuously seek new ways to improve the quality of care by analyzing for causes and modifying interventions or developing new ones.

## Results

Monitoring indicators to track standards over several months demonstrated the sustained impact of the many solutions. This section highlights achievements gained by the QI teams and management action over a four- to six-month period (August or October 2000 to February 2001).

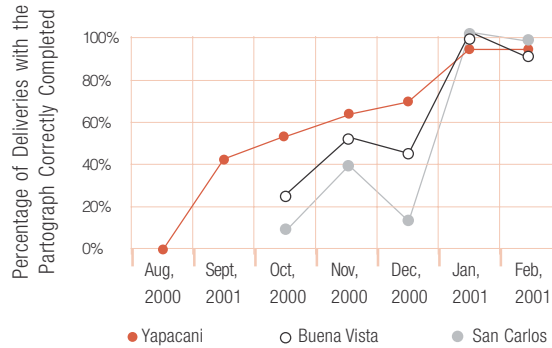
**Use of the partograph to monitor labor and delivery.** At first, many healthcare providers did not use the partograph because they lacked confidence in their ability to use it, did not understand its importance as an early warning system to detect complications, and/or could not



use it because worksheets were lacking. The teams implemented interventions that communicated to healthcare providers the importance of the partograph, improved their ability to use it, and ensured an adequate supply of worksheets. The teams measured how often the partograph was used correctly. Correct use increased from 0 to 95 percent at Yapacani and from 24 to 92 percent at Buena Vista; San Carlos achieved 100 percent

compliance with this standard in two consecutive months (see Figure 6).

**Figure 6. Improvements in the Correct Use of the Partograph**



This increase in the correct use of the partograph marks a significant improvement in the quality of EOC—because complications can be detected and referred earlier if this tool is used effectively.

**Laboratory exams.** All three of the labor and delivery teams decided to improve compliance with the standard for performing laboratory exams during labor and delivery, and each approached it differently. While the San Carlos team communicated with personnel about the importance of this standard and conducted a half-day training, the teams at Yapacani and Buena Vista established mechanisms that would ensure that the tests were conducted even when the laboratory technician was off duty.

**Figure 7. Improvements in Compliance with Laboratory Testing**

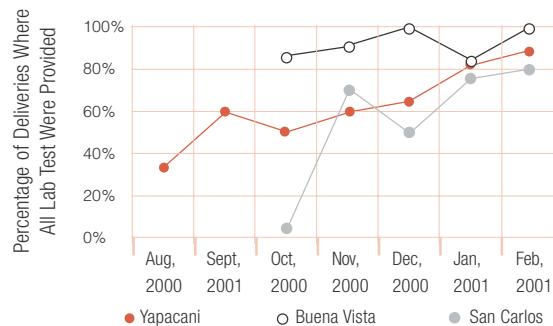
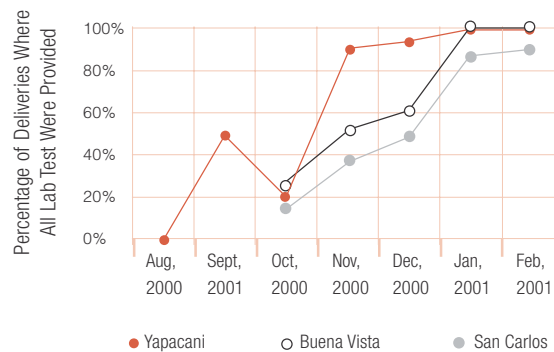


Figure 7 shows their success: increases from 33 to 88 percent at Yapacani, from 83 to 100 percent at Buena Vista, and from 7 to 80 percent at San Carlos. These results not only represent great improvement in providing the appropriate laboratory tests for women in labor and delivery, but also demonstrate the powerful effects of learning from each other through multidisciplinary teams. Here, the laboratory technician and nurses contributed significantly to enriching and improving each other's services provided during labor and delivery.

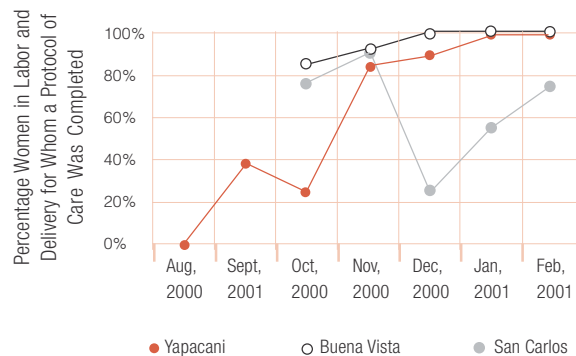
**Monitoring during the first two hours after delivery.** All hospitals achieved remarkable improvements in compliance with the standard to ensure that women's vital signs, bleeding, and uterine status are closely monitored for at least the first two hours after delivery. Buena Vista and Yapacani achieved 100 percent compliance with this standard for two months in a row while San Carlos reached 92 percent (Figure 8). These successes in improving immediate postpartum care are now being recognized throughout Ichilo. In fact, a form developed by the Yapacani team to systematize and record this monitoring is now being implemented at all Ichilo health facilities. This example shows how quality improvement can empower and motivate healthcare providers to contribute to the improvement of the care provided by the entire health system.

**Figure 8. Improvements in Monitoring for Vital Signs, Bleeding, and Uterine Status in Immediate Postpartum Care**



**Protocol of care.** A protocol of care is an important record of the treatment provided to a patient. It protects the rights of patients by serving as a legal document should a review or audit of a case be necessary to determine whether proper care was provided. Each hospital developed a format for the protocol of care, clearly indicating the steps that were taken to care for the woman, by whom, and any necessary follow-up procedures. Figure 9 shows that Yapacani and Buena Vista both improved their performance in this standard: from 8 to 100 percent and 83 to 100 percent, respectively. The San Carlos team suffered a significant decline in December, indicating a need to revisit the problem and begin rapid team problem solving again.

**Figure 9. Improvements in Completing the Protocol of Care Form**



**Results related to other labor and delivery standards.** In addition to the achievements with the four standards addressed at all hospitals and described above, the QI teams achieved results in standards they each developed for their own hospitals. These standards covered a variety of areas: infection control, perinatal record keeping, and referrals and counter referrals.

The *Yapacani and Buena Vista teams* both chose to implement the standard that *all women who deliver at the hospital will have an accurate and complete perinatal clinical record of their pregnancy, delivery, and postpartum*

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*periods.*<sup>9</sup> This record identifies potential risk factors for obstetric and neonatal complications and therefore is essential in planning safe deliveries. Completion of this record has improved at Yapacani from 15 percent (August 2000) to 98 percent (February 2001); Buena Vista improved its performance from 24 percent (October 2000) to 92 percent (February 2001).

The **Yapacani team** also improved compliance with three other standards:

□ *Any woman at risk of an obstetric complication who delivers at Yapacani hospital will receive a Branula catheter.*<sup>8</sup> The QI team studied the use of Branulas and realized that waiting to insert a Branula until a complication occurred meant that precious time was wasted. Furthermore, inserting a Branula is difficult during the onset of the complication. When the team implemented this standard in August 2000, none of the women at risk of a complication received a Branula. The causes for low usage included a lack awareness of its benefits, failure to train personnel in using it, and a shortage of Branula supplies. The QI team conducted a training and orientation about Branula use and implemented an inventory system to maintain its supply. Yapacani achieved 100 percent compliance with this standard from November 2000 until this writing (July 2001). This achievement not only indicates effective use of the Branula catheter, but also demonstrates the use of the perinatal clinical record and protocol of care to plan for patients with identified risk factors.

□ *All women referred to a higher level of care during labor, delivery, or the immediate postpartum period will be documented in a registry of referrals and counter-referrals.* The hospital director sent a memorandum to all healthcare providers and held a meeting to discuss the importance of this process to personnel. At the baseline measurement in

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<sup>8</sup> A Branula is a flexible, intravenous catheter that can be securely fastened so that a patient can move her arm freely without having the needle fall out or become obstructed. Branulas were originally inserted for Yapacani deliveries only upon the onset of complications.

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August 2000, none of the referrals or counter-referrals at Yapacani was registered. Between December 2000 and this writing, 100 percent of women delivering at the hospital were registered; these results are expected to continue.

□ *All women admitted for delivery will receive orientation about respiratory exercises, positioning, and pushing during delivery.* The team decided to develop a guide for patients and support materials for healthcare providers to orient women about these topics before delivery. The laboratory technician conducts a monthly, random customer satisfaction survey to assess how many women in delivery receive this orientation and their level of satisfaction with it. When Yapacani wrote this standard in August of 2000, no women who delivered there had received information on these topics; since January 2001, 100 percent have received this information.

The ***Buena Vista team*** developed and implemented two standards to personalize labor and delivery for clients: (a) *Each woman is allowed to choose her position during delivery,* and (b) *Each woman is presented with the option of being accompanied by a family member during delivery.*

To implement these standards, the team sought training for healthcare providers in helping women to use alternative positions for delivery and purchased a special support cushion for squatting deliveries. The team also bought fabric to make extra gowns so that a family member could attend normal deliveries. As of February 2001, 100 percent of women in prenatal care at Buena Vista were presented with the option of choosing an alternative position (46 percent elected this option). Likewise, 100 percent of the women were presented with the option of being accompanied by a family member during delivery (53 percent chose this option). A QI team physician indicated that for her, this was one of the most powerful changes implemented by the QI team. The physician told of a woman who delivered her first six children at home with a traditional birth attendant. The physician said that the woman chose Buena Vista for her seventh delivery because she could choose her position and have her husband with her during delivery.

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This story illustrates one of the main principles of quality improvement: to provide quality care with a focus on the client.

The **San Carlos team** concentrated on compliance with a standard to address infection control: “All women in labor will be prepared for delivery with warm water and soap.” When the QI team measured for the baseline, only 4 percent of the women in labor received this care. The team decided that since this was a relatively simple procedure, communication from the hospital director to personnel would improve compliance. Indeed, in January and February 2001, San Carlos achieved 100 percent compliance.

### Next Steps and New Challenges

The labor and delivery QI teams accomplished rapid results in improving compliance with standards. All of the QI teams have decided to continue to monitor the standards discussed in this case study at least quarterly to ensure that the results are sustained. In addition to sustaining improvements, the QI teams are sharing successful interventions with each other and adapting interventions that would improve the quality of their services.

The next challenge will be to maintain these results while continuing QI efforts in new standards and technical areas. The teams plan to focus on improving compliance with additional EOC standards, particularly in the management of obstetric complications.

### Quality Improvement Insights

The improvements highlighted in this case study—increased compliance with standards of care for labor and delivery—will contribute to the overarching goal of the teams: to reduce maternal mortality and morbidity in Ichilo by providing quality care in their hospitals.

The teams in Ichilo have demonstrated their ability to apply the QI methodology to improve compliance with standards for labor and delivery. Once decisions were made on which problems could be addressed by management action and

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which required team problem solving, an ambitious number of areas for improvement could be addressed. By closely monitoring each standard, team members determined the impact of the interventions and used the data to determine whether further interventions were necessary. The Ichilo experience demonstrates how multidisciplinary teams can use rapid team problem solving to achieve dramatic improvements in the quality of care. It also provides several key insights about future applications of this methodology:

**Improving the quality of care does not always require additional resources.** Dramatic improvements were achieved by changing the way work was organized and without adding new resources. An example is in laboratory testing for patients in labor and delivery when the technician is off-duty. Instead of giving up because another laboratory technician could not be hired, the team probed for creative, low-cost solutions and realized that training nurses in laboratory tests was a viable alternative.

**Quality improvement fosters a sense of ownership of the problem and solutions.** Many solutions are continuing because the healthcare workers feel ownership of the interventions. This sense of ownership stems from the fact that the team members worked together to identify and analyze a problem that they determined was critical to the quality of care and then developed, tested, and implemented the interventions.

**Quality improvement is motivating, especially when it is noticed and rewarded by clients, managers, and others.** In April of 2001, the MOH ranked Yapacani as the fourth best hospital in Bolivia (out of 2,500) for secondary-level care. Based on its high level of compliance with standards and customer satisfaction, this recognition validated the team's efforts and motivated them to continue to expand quality improvement endeavors.

**Quality improvement is most successful when teams have the full support of leaders.** Hospital directors, district directors, and SEDES supervisors were active in the QI process; some even served as team



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members or facilitators. By showing interest in the teams' work and communicating that quality improvement was a priority in Ichilo, these managers helped sustain team effort and contributed to their success (and continue to do so).

**Quality improvement teams can achieve rapid results.** When team members have insight into the potential causes of a problem—or determine that management action is sufficient—problems can be analyzed and solutions developed and tested quickly. The QI teams in Ichilo exemplify this point as they achieved results as early as two months after implementing solutions. These rapid results motivate QI teams as they can quickly see the benefits of their hard work.

**Sharing ideas and results among teams leads to rapid results.** The teams in Ichilo achieved rapid results in part because they focused on many of the same issues and could share interventions with each other and adapt them for their own hospital's situation. In February of 2001, the QA Project coordinated a workshop for teams to present their results and share their interventions. Teams learned from each other's experiences and developed a healthy spirit of competition to demonstrate the greatest improvements in quality. For example, the efforts to personalize labor and delivery at Buena Vista sparked interest among the other teams in implementing similar standards.

**Decentralized health systems seem to present a responsive environment for the application of the QI methodology.** The highly decentralized system in Bolivia fostered active participation among personnel and district managers. Since district and departmental supervisors are responsible for the management of local health services, they had the authority to lead and support the quality improvement teams.

**Facilitation was critical at two points in the Bolivia experience: at the beginning of rapid team problem solving and at decision-making junctures.** The facilitators helped determine whether management action or team problem solving would be the better approach for different problems. They urged teams to

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adopt a team spirit rather than blame others when the baseline measurements were disappointing. Facilitators also participated in discussions evaluating the feasibility of proposed solutions and helped monitor indicators.

**Rapid team problem solving can bring community concerns to healthcare quality improvement.** The teams both addressed MOH standards and developed new ones that reflect their understanding of clients' expectations. Satisfying clients fosters healthcare utilization and, ultimately, better health outcomes.

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<sup>a</sup> World Bank. 2000. *Entering the 21<sup>st</sup> Century: World Development Report 1999/2000*. New York: Oxford University Press.

<sup>b</sup> Pan American Health Organization. 1999. *Situacion de Salud en Bolivia*. <[www.ops.org.bo](http://www.ops.org.bo)>.

<sup>c</sup> J. Ashton. 2001. *Monitoring the Quality of Hospital Care. Health Manager's Guide*. Bethesda, MD: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project.

<sup>d</sup> Massoud, R., K. Askov, J. Reinke, L. Miller Franco, T. Bornstein, E. Knebel, and C. MacAulay. 2001. *A Modern Paradigm for Improving Healthcare Quality. QA Monograph Series 1(1)*. Bethesda, MD: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project.

<sup>e</sup> Hermida. 2001. *QAP Results from the Field: A Quarterly Report on Results from Latin America*. Quito, Ecuador: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project.

<sup>f</sup> W. Shewhart. 1931. *The Economic Control of Quality of Manufactured Products*. D. Van Nostrand Co, New York: Reprinted by the American Society of Quality Control in 1980.

<sup>g</sup> Díaz, A.G. 1990. *Sistema Informático Perinatal*. Centro Latinoamericano de Perinatología. Montevideo: Uruguay.

### **Improving Compliance with Standards for Essential Obstetric Care in Bolivia**

This case study highlights the effectiveness—and describes the process—of rapid team problem solving in a developing country healthcare setting. It tells the story of quality improvement teams comprised of labor and delivery personnel at three hospitals in Ichilo, Bolivia. The teams applied rapid team problem solving in areas related to essential obstetric care and achieved significant results in only a few months. With support from the Santa Cruz Health Department and the Quality Assurance Project, these teams identified opportunities for improvement related to standards that had been promulgated by the Ministry of Health or that they devised themselves to reflect the quality expectations of their communities. Particularly impressive results were achieved with regard to using the partograph correctly during labor and delivery and in postpartum monitoring, both life-saving protocols.

This study details the steps of rapid team problem solving as performed by teams, presents the indicators of improvements achieved, and offers insights for other groups seeking to implement quality improvements by using rapid team problem solving at their own healthcare facilities.

