Obstetrical Team Training:

How the Response to a Tragic Event Revolutionized Care Across the Country

By Diane Shannon, MD, MPH

In this article...

Take a look at how team training in obstetric units improved working conditions, led to a safer environment and reduced disruptive behavior.

In November of 2000, a healthy 38-year-old woman presented to a pre-eminent academic medical center for elective induction after a full-term, uneventful pregnancy.

An initially routine labor ended the next morning with the delivery of a stillborn fetus, uterine rupture, which eventually required hysterectomy, and numerous complications including disseminated intravascular coagulation that necessitated transfusion and an 18-day stay in the intensive care unit.

The case had a seismic effect on the obstetrics staff, which had "always prided themselves on providing high quality care."[1] Later, the department chair and quality assurance staff identified a number of errors in communication and judgment associated with the case. Leaders of the medical center, Beth Israel Deaconess Medical Center (BIDMC) in Boston, issued a public apology. The captive insurer for the institution settled the case within several months.

In many scenarios, this might have been the end of a heartrending story. Instead, closure of the legal aspects of the case marked the beginning of a new chapter in the search for solutions to prevent the errors that ultimately resulted in the catastrophic loss.

The 1999 Institute of Medicine report *To Err is Human* focused attention on the significant number of preventable medical errors that occur in the United States each year.[2] In the years since the release of this landmark document, risk experts have highlighted the importance of not only preventing errors but also intercepting any errors that do occur before they result in an adverse outcome for the patient.[3]

Improving individual providers' clinical or diagnostic skills is not sufficiently effective for preventing and intercepting these mistakes. Instead, significant prevention and mitigation of errors requires systematic improvement in care delivery.

While the vast majority of births occur without serious complications or adverse outcomes, when these rare events occur, the consequences are especially hard hitting. In obstetrics, the consequences of preventable medical errors are especially devastating, because of the hopeful expectations with which expecting mothers and fathers anticipate the birth of a child, and because the lives of two usually healthy individuals are directly affected.

Apology, analysis, change

About the same time as the event at BIDMC, the Department of Defense (DOD) approached the captive insurer of the Harvard-affiliated hospitals about involvement in a study of the use of its team training program, Crew Resource Management, in labor and delivery.

The DOD invited BIDMC to become the lead site in the trial that included civilian, academic, and military hospitals. As part of the study, a review team from the hospital analyzed data from obstetrical malpractice claims that closed between 1990 and 2000.

The analysis showed that communication gaps had occurred in 67 percent of cases.[4] Furthermore, the insurer estimated that 42 percent of all cases could have been prevented or mitigated with improved teamwork skills, such as effective communication and use of cross-monitoring.

These data are consistent with a Joint Commission finding that communication breakdowns had occurred in 72 percent of obstetrical cases that resulted in a neonatal death.[5] Similarly, an analysis of adverse obstetrical events at an academic medical center found preventable contributing factors, including poor communication, had occurred in 78 percent of cases.[6]

As part of the study and in light of the 2000 tragedy, members of the obstetrics department—with an additional grant from the insurer—adapted the military program for health care to make the teachings specific to the OB setting. It marked the first time a military health care team training program was adapted for this clinical area.

Once developed, the four-hour didactic and interactive curriculum was used to teach specific teamwork and communication skills to attending physicians (obstetricians, pediatricians, and anesthesiologists), residents, and nurses. Following the training, new teamwork practices were rolled out sequentially.

Over the subsequent six months, the team that initially taught the courses served as coaches, reinforcing new teamwork behaviors to support the core concepts of teamwork. Meanwhile, organizational leaders took steps to ensure that the culture of the institution supported greater patient safety, such as broadening

"After training, I think the nurses feel a more integral, a more equal part of the team.... If a nurse feels uncomfortable, she needs to speak up and if the response is 'I'm the doctor and you're the nurse, do what I say,' that response is no longer acceptable."

Figure 1

Core Concepts of Teamwork

- Every patient should have a plan.
- All providers caring for the patient are aware of the plan.
- All staff are aware of physician location and coverage for each patient.
- All staff participate in identified communication events (e.g., team meetings).
- Conflicts regarding strip interpretation, patient management, or triage of cesarean deliveries are managed constructively.

the scope of the institution's quality assurance programs to include review of cases identified by specific quality metrics or by referral of clinical or clerical staff.

Implementation of the teamwork skills resulted in measurable improvements in quality and safety in obstetrical care. Using the Adverse Outcome Index (AOI), a newly developed global metric of obstetrical outcomes, and the related Weighted Adverse Outcome Score (WAOS), the department witnessed a significant reduction in adverse events, with the WAOS falling from 5.9 percent at baseline to 4.6 percent at four years after implementation of the teamwork behaviors.[7]

Malpractice claims data from the insurer showed a reduction in the number of lawsuits, claims, and potential cases from 21 to 16 and a reduction of 62 percent in the number of high-severity adverse events.[7]

Upon publication of these results, leaders of hospitals outside the Harvard system inquired about the possibility of bringing the training to their obstetric units. The insurer's external consulting arm, RMF Strategies, with members of the obstetrical team serving as facilitators and trainers, handled the expansion of the program to external organizations. Many of these organizations became involved after risk management officers attended patient safety conferences at which the BIDMC outcomes were presented.

What teamwork really entails

The training program developed at BIDMC is based on five core concepts of teamwork, which are listed in Figure 1. The program is presented in one of two formats:

1. A train-the-trainer model, in which program faculty teache nurse-physician pairs teamwork skills and how to teach these skills to their colleagues.
2. A train-the-staff model where program faculty directly train all staff.

In addition to didactic and interactive experiences during training, the program includes a readiness assessment prior to the training and one year of support and follow-up after implementation (see Figure 2).

Among other skills, program participants learn to use four structured events for communication:

1. Team meetings
2. Team huddles
3. Briefings
4. Debriefings

Each of these events offers an opportunity for direct and collaborative information exchange. Faculty members also encourage the development of an organizational structure to support improved teamwork and communication.

For example, at BIDMC a coordinating team, consisting of an obstetrician, a charge nurse, the chief resident, and an anesthesiologist, maintains a high-level view of the unit, anticipating and addressing staff resource needs and assisting in conflict resolution.

Peter Rotolo, MD, was chair of the department of obstetrics and gynecology at Winchester Hospital when staff at the Massachusetts hospital participated in the training. The organization has a long-term relationship with BIDMC: maternal-fetal medicine experts from the Boston hospital see patients at offices in Winchester Hospital three days a week. Leaders at Winchester were impressed with the results seen at BIDMC, and the board of directors supported the decision to participate in the training program.

Although Winchester staff members were familiar with the training program from several grand rounds presentations, they were mildly resistant about beginning an unfamiliar process with new terminology.

Within six months of completing the mandatory course, however, staff began to consider the new teamwork behaviors to be routine.

"It takes a little while to get used to the new way of addressing each other…It helped people to have the language and the comfort to say, 'I'm not comfortable with what you're doing. Can you tell me why you're doing it?'" Rotolo said. The training is about improved interactions between staff members. "If I had to put the whole program into one word, it would be communication. We have a very much improved level of communication between caregivers now."

After selected staff at St. Mary's Hospital in Waterbury, Connecticut, completed the train-the-trainer program, obstetrics department chief Mark Albini, MD, deemed the teamwork course mandatory for all physicians, midwives, physician assistants, medical aids, housekeeping staff, and clerical staff in the department. He encountered little resistance from the obstetrics staff but found that anesthesiologists were less-than-enthusiastic about participating. He recalls a turning point several months after training was complete.

A young pregnant woman with a terminal condition presented for surgery. The plan was to perform the needed thoracotomy first, then perform the C-section. Staff called a team meeting—one of the key teamwork tools—to discuss the patient's management.

During the course of the meeting, staff brought up several concerns with the plan—most importantly, that the patient would be unable to bond immediately with her infant if under general anesthesia post-

Figure 2

Overview of Teamwork Curriculum

Module Tool	Skill Description
Leadership	
Role clarity	The leader is responsible for designating and clarifying the roles and responsibilities of team members.
Resource	Appropriately allocating resources to balance workload to ensure no patient is at risk owing to overworked staff.
Team Events	The leader ensures that team meetings, huddles, briefings, and debriefings occur.
Conflict	Leaders help team members resolve interpersonal or cognitive resolution conflicts.
Communication	
SBAR	Defined technique for communication of relevant patient information
DESC	Defined technique for conflict resolution
Check back	Closed loop communication between the sender and receiver to ensure message is correctly understood
Call out	Calling out loud to staff important decision for anticipating next steps
Shared Vision	
Situation Awareness	The process of scanning the unit to assess patients, team members performance, and the environment
Situation Monitoring	The state of knowing what factors effect the work environment and how to respond
Shared Mental Model	The development and articulation of a shared vision/plan (SMM) among providers for the patients' care
Error Prevention Strategies	
Task Assistance	Asking for or offering assistance to a team member
Cross Monitoring	Checking in on a team members and confirming their assessments ("watching each others-backs")
Advocacy & Assertion	Speaking directly to (or escalating to) another team member about a safety concern
Conflict Resolution	The process of positively resolving both cognitive and affective disagreements among team members

thoracotomy. Members of the entire multidisciplinary team were able to voice their opinions and suggestions and have input into the management plan—before the surgery began.

The team decided to perform the C-section first, giving the woman the chance to bond with and breastfeed her infant. After an uneventful delivery, the patient spent several days with her child before undergoing the thoracotomy.

According to Albini, if the case had occurred before training, care would have been less coordinated and would have pursued a very different management plan. In addition, he believes that use of the team meeting allowed all members of the health care team to feel their insights were heard and valued.

After participating in the team effort, two anesthesiologists approached Albini and said, "This process is unbelievable. Now we can see what you were talking about." On the basis of the teamwork skills shown during the management of the case, the chair of surgery at the hospital decided to pursue team training for the department of surgery.

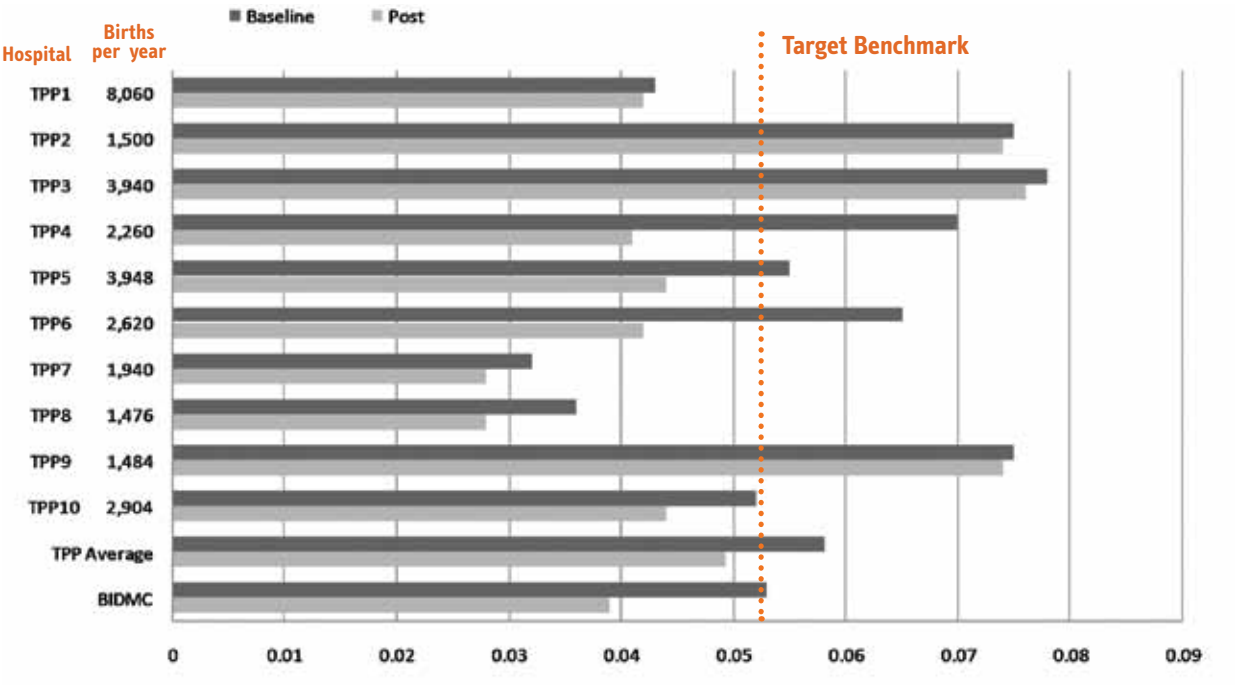
According to Penny Greenberg, chief nursing officer at BID Hospital Needham and a program faculty member, team training gives individuals the tools to speak directly to one another.

"There is a tendency in any care unit to talk to everyone except the person with whom one has a disagreement. 'I can't believe Dr. X yelled at me in front of the patient. He always does this.' Instead of speaking directly to the physician, and saying 'Dr. X, when you yell at me in front of the patient,

Figure 3

Measuring the Impact of Team Training

Adverse Outcome Index (AOI) scores before and after TPP Team Training



All hospitals shown have completed 4 Q's of post-implementation data. Baseline data period is 8 quarters for most hospitals. Some reflect shorter baseline period.

Reduced scores reflect improvement in the AOI measurement

it really upsets me and undermines my position as the patient's nurse and the patient loses confidence in me. If you have a problem with something I have done, we need to have a discussion about it. I want to be able to work well together so that our patient is well taken care of.'"

Team training provides staff members with an opportunity to clear the air after a conflict or disagreement, thus fostering better communication and the ability to work collaboratively.

Safety and quality outcomes

To date, obstetrical staffs in 27 hospitals across the country have completed the training program based on the BIDMC prototype. Figure 3 shows the average adverse event measures for the first 10 hospitals with data one year post-training.

The average scores were improved after training compared with the baseline levels prior to the training program. Individual scores for all hospitals were lower, with a majority maintaining or reaching the target benchmark based on the initial experience at BIDMC in the first year of training.

On the basis of the improved safety and malpractice claims data at BIDMC, the medical center's captive insurer lowered the malpractice premiums for obstetricians who participated in team training, completed online courses, and answered questions related to care guidelines. According to leaders of other hospitals whose staffs participated in the team training, sufficient data have not yet accumulated for their organizations to see a trend in malpractice claims.

In addition to the improvements in hard data, leaders of hospitals whose staffs have participated in the team training have noticed progress in soft indicators as well. According to Albini, the training has solidified a patient safety culture at the hospital.

"We had started to change the culture before team training, but the training program quickened the pace and codified it. Now, this is how we do business here." In addition, he believes that the obstetrics nurses think of themselves as a more vital part of team.

"After training, I think the nurses feel a more integral, a more equal part of the team.... If a nurse feels uncomfortable, she needs to speak up and if the response is 'I'm the doctor and you're the nurse, do what I say,' that response is no longer acceptable."

BIDMC leaders have experienced additional benefits from the training, including decreased nursing turnover and sick calls, improved satisfaction of physicians, more on-time starts for scheduled inductions and C-sections, and more consistent communication with patients about management plans.

Susan Mann, MD, director of team training and simulation in the department of obstetrics and gynecology at BIDMC, reports that reduced nursing turnover has been a very obvious improvement in the department.

In 2000, the department occasionally filled nursing shifts with agency nurses. Today, there is a waiting list for staff nursing positions on the unit. In addition, several of the nurses who left the hospital for positions closer to home eventually returned to the unit, because they preferred the working environment at BIDMC. An internal employee satisfaction survey demonstrated that the obstetrical staff had more positive attitudes about the safety of their clinical unit than did staff in the rest of the medical center.[7]

Improved teamwork also may improve the patient's experience of care. Joel Yohai, MD, chief medical officer of Catholic Health System of Long Island, approved team training for the four hospitals offering obstetrical services within the health system. He believes that the training contributed to the health system's improved patient satisfaction scores regarding how well staff work together as a team. "I believe in team training. I think that teamwork is essential to providing care in this very complicated world of medicine."

Rotolo reports a possible, less direct, outcome of the training program. The high-level of communication and teamwork within the department has allowed the team to care for higher-acuity maternity patients than other hospitals of similar size and configuration.

Rotolo cannot identify team training as having a direct cause and effect relationship with the unit's ability to manage these cases, but he believes strongly that increased communication and teamwork skills make for better care of high-risk maternity patients.

Addressing disruptive behavior

Leaders of hospitals whose staff participated in the BIDMC-based training report a number of positive spillover effects of the program, including help with two especially challenging tasks:

- Addressing disruptive staff behavior
- Increasing engagement in safety and quality initiatives

According to **Dana Bissett Siegal, RN, CPHRM**, program director of risk management services at RMF Strategies, the training helps

prevent and address disruptive staff behavior.

"Team training provides a structure for the protections that we need—such as cross-monitoring of fetal monitoring strips and protocols for escalation to the department chief—without attacking the individual. It sets the rules and expectations for dealing with difficult peers and conflict."

Rotolo found the training effective for dealing with inappropriate behavior because it provided staff with the communication skills and confidence to question other providers about their actions. "The program helped with the type of disruptive behavior that every hospital experiences with physicians, because it improves two-way communication and prevents some of the behavior doctors used to get away with," —including, according to Rotolo, difficult interactions among physicians.

During the course of the program's year-long follow up phase after training, Greenberg generally finds that staff report less disruptive behavior among nurses and physicians. In addition, when such behavior does occur, there is less tolerance for it, and the behavior is addressed directly rather than ignored.

Directly addressing the conflict is critical, according to Greenberg, because of the potential impact on patient care. "If there is a problem in the interpersonal relationship between two providers, it is going to cause an issue in communication. And in obstetrics, we need to work very closely. We need to be able to work collaboratively as a team and communicate well."

Team training also has helped engage physicians and other clinical staff in improvement initiatives. Members of the BIDMC obstetrics staff found that identifying gaps in teamwork often illuminated patient safety concerns that could then be directly addressed.

For example, the team developed protocols for the management of massive maternal hemorrhage and shoulder dystocia because of concerns about communication breakdowns during management of these critical events—communication gaps made obvious because of the teamwork skills acquired through training.

Recently, members of the department introduced a shoulder dystocia worksheet as a quality and safety initiative. During a delivery that involves this complication, one staff member documents interventions on the worksheet. Both nurses and physicians use this documentation when crafting their notes, ensuring consistency in record keeping.

According to Mann, "The worksheet would not have been used or embraced five years ago, but because the culture has changed, our staff was ready and engaged with its use."

Survey data confirm this culture shift. After implementation of the teamwork initiative, staff in the labor and delivery unit were much more likely to agree with safety-related statements such as "I have the support I need from other personnel to care for patients," and "My suggestions about safety would be acted upon if I expressed them to management," compared with staff from all other departments in the medical center.[7]

What's next?

In addition to expanding the obstetrics team training beyond the walls of its site of inception, the training is now being adapted for other clinical areas, including the emergency department and surgery. While the core concepts remain the same, team training for these clinical settings varies slightly.

The faculty realized that the obstetrics training could not be simply applied to other settings, but needed to be adapted to differences in these areas.

For example, training for emergency department staff needed to take into account differences such as the structure of care delivery, the types of clinical interactions, and rapid patient turnover. According to Siegal, the design of emergency departments often includes a number of smaller, independent teams rather than one large interdependent "unit," as is often found in obstetrics.

On the basis of his experience with obstetrics team training, Yohai has held similar training for ED staff at the hospitals within in his health system and now plans to extend team training to high-risk OR settings with the eventual goal of having all surgeons participate.

Patient safety experts often cite aviation as a field with many parallels to health care: both involve complex systems requiring myriad decisions based on multiple inputs. The parallel for the teamwork training as a means for improving safety appears to hold true as well.

As Rotolo puts it, "People have been empowered with team work training to step up and say something. To stop the plane from taking off."

Diane Shannon, MD,
is a freelance health care writer.
dshannon@mdwriter.com

For more information about team training, contact Susan Mann, MD, at Beth Israel Deaconess Medical Center (smann@bidmc.harvard.edu) or Dana Bissett Siegal, RN, CPHRM, at RMF Strategies (DBissett@rmf.harvard.edu).

References:

1. Sachs BP. A 38-year-old woman with fetal loss and hysterectomy. *JAMA*. 294(7):833-40, Aug. 17, 2005.
2. Kohn LT, Corrigan JM and Donaldson MS (Institute of Medicine). *To err is human: building a safer health system*. Washington, DC: National Academy Press, 2000.
3. Nolan TW. System changes to improve patient safety. *BMJ*. 320(3237): 771-3, Mar. 18, 2000.
4. CRICO/RMF. Controlled Risk Insurance Company, LTD/Risk Management Foundation. Internal data, Boston, MA.
5. Joint Commission. Sentinel event alert. Oak Brook, IL: Joint Commission, Issue 30, 2004.
6. White AA, Pichert JW, Bledsoe SH, Irwin C and Entman SS. Cause and effect analysis of closed claims in obstetrics and gynecology. *Obstet Gynecol*.105(5pt1):1031-8, May 2005.
7. Pratt SD, Mann S, Salisbury M, Greenberg P, Marcus R, Stabile B, and others. Impact of CRM-based team training on obstetric outcomes and clinicians' patient safety attitudes. Jt Comm J *Qual Patient Saf.* 33(12):720-5, Dec. 2007.