No Pain Labor & Delivery: A Global Health Initiative’s Impact on Clinical Outcomes in China

Ling-Qun Hu, MD,* Pamela Flood, MD,† Yunping Li, MD,‡ Weiike Tao, MD,§ Peishan Zhao, MD, PhD,|| Yun Xia, MD, PhD,¶ May C. Pian-Smith, MD, MS,† Francis S. Stellaccio, MD,** Jean-Pierre P. Ouanes, DO, MS,†† Fengling Hu,‡‡ and Cynthia A. Wong, MD§§

The availability of labor analgesia is highly variable in the People’s Republic of China. There are widespread misconceptions, by both parturients and health care providers, that labor epidural analgesia is harmful to mother and baby. Meanwhile, China has one of the highest cesarean delivery rates in the world, exceeding 50%. The goal of the nongovernmental No Pain Labor & Delivery (NPLD) is to facilitate sustainable increases in vaginal delivery rates by increasing access to safe neuraxial labor analgesia, thereby decreasing the cesarean delivery rate. NPLD was launched in 2008 with the stated goal of improving labor outcome in China by increasing the absolute labor epidural analgesia rate by 10%. NPLD established 10 training centers over a 10-year period. We hypothesized that increased availability of labor analgesia would result in reduced requests for cesarean delivery and better labor outcomes for mother and baby. Multidisciplinary teams of Western clinicians and support staff traveled to China for 8 to 10 days once a year. The approach involved establishing 24/7 obstetric anesthesia coverage in Chinese hospitals through education and modeling multidisciplinary approaches, including problem-based learning discussions, bedside teaching, daily debriefings, simulation training drills, and weekend conferences. As of November 2015, NPLD has engaged with 31 hospitals. At 24 of these sites, 24/7 obstetric anesthesia has been established and labor epidural analgesia rates have exceeded 50%. Lower rates of cesarean delivery, episiotomy, postpartum blood transfusion, and better neonatal outcomes were documented in 3 impact studies comprising approximately 55,000 deliveries. Changes in practice guidelines, medical policy, and billing codes have been implemented in conjunction with the modernization of perinatal practice that has occurred concurrently in China since the first NPLD trip in 2008. (Anesth Analg 2016;122:1931–8)
The high rate of cesarean delivery in China can be attributed to many factors. Low household income does not appear to play a primary role, because affluent, educated Chinese women often prefer cesarean rather than vaginal delivery, believing that cesarean delivery is safer when planning a single birth, as permitted under China’s one-child policy. Many women opt for cesarean delivery to avoid the pain, anxiety, and distress associated with vaginal delivery without analgesia. In addition, the medical reimbursement system in China, similar to many other countries, provides greater reimbursement for cesarean than for vaginal delivery.

The nongovernmental No Pain Labor & Delivery (NPLD), established and designed to educate Chinese women and their health care providers about the safe and effective use of labor analgesia, was developed at the Northwestern University Feinberg School of Medicine. Launched in 2008, NPLD’s goals were to improve maternal and neonatal clinical outcomes by increasing the rate of labor epidural analgesia by 10% and to promote sustained change in obstetric anesthesia care, with measurable improvements in outcome. NPLD features a series of stepwise, progressive educational programs to ensure both uniformity and continuity at each site and over time. Benchmarks were created and implemented to measure these outcomes.

Over the past 8 years, NPLD has expanded to include not only clinicians from major academic institutions but also individual private practice clinicians from several North American and European countries. Funding for NPLD has been provided by the Departments of Anesthesiology at Northwestern University Feinberg School of Medicine, Harvard Medical School at Beth Israel Deaconess Medical Center, Johns Hopkins University School of Medicine, and Mount Sinai St. Luke’s Hospital in New York City. The project has also received funding from the Massachusetts General Hospital Center for Global Health Travel Awards, the Society for Obstetric Anesthesia and Perinatology (SOAP)/Kybele International Outreach Grant, and funds from the participating hospitals in China. Finally, participating individuals and several international and Chinese commercial educational funds have provided support for NPLD.

The training NPLD provides to Chinese labor ward clinicians is protocol-driven, following evidence-based practice and employing safety checklists. During 8 years of NPLD implementation in China, we continuously measured clinical outcomes to evaluate the effectiveness of our efforts to implement program goals.

PROJECT STRUCTURE
The NPLD program consists of 3 multidisciplinary projects. The first 2 are basic obstetric projects: the Obstetric Anesthesia Infrastructure Development (OAIM) Project and the Obstetric Anesthesia Support (OAS) Project. The third is the Advanced Obstetric Anesthesia 1 + 2 + 3 Project (AOA123), offered to programs that participated in the OAIM project as a “next step” in sustaining improvements in obstetric anesthesia care.

Obstetric Anesthesia Infrastructure Development Project
The OAIM project was launched in 2008 at the Women’s Hospital of Zhejiang University School of Medicine. It has since been implemented at 24 additional hospitals. The OAIM project involves a week-long, hands-on session offered by an interdisciplinary team from the United States, Canada, and Europe. The program is offered at 1 to 6 sites per year, depending on the number of volunteers and available resources. OAIM is offered only to sites that meet specific screening requirements (Table 1).

Multiple teams travel to China during a 1-week period once a year. A typical team consists of 2 obstetric anesthesiologists attending physicians, 2 anesthesiology residents, 1 or 2 obstetricians, 2 labor and delivery nurses, 1 neonatologist or neonatal intensive care nurse, and 2 interpreters. The team leader is typically a Chinese-born obstetric anesthesiologist practicing in the United States. The team leader is thus fluent in both Mandarin and English and familiar with Western standards of obstetric care.

Didactic sessions include fundamental concepts of neuraxial analgesia and resources necessary for safe and effective care. The team uses detailed bilingual protocols for education and practice. The training is typically “hands-on,” with the NPLD team supervising neuraxial analgesia/analgesia administered by Chinese physicians. Each day is organized around a theme (Table 2). Additional training is provided using simulation drills of various obstetric emergencies. In these simulation drills, NPLD team members typically offer an initial example of appropriate response, which is then practiced by the Chinese providers. The simulation drills emphasize safety, communication, and various technical and managerial skills.

Daily multidisciplinary debriefings are held at the end of each day to address the knowledge gained and lessons learned. The end-of-day debriefings increase the number of doctors, nurses, and administrative staff who learn from the NPLD teams. Questions range well beyond anesthesia topics, often including optimal maternal and perinatal care. To the extent possible, answers are based on the best available evidence. Debriefings also provide an opportunity to discuss deviations from safe practices observed by the NPLD team and explore opportunities for improving care.

Obstetric Anesthesia Support Project
The OAS Project was established in 2014 as an alternative to OAIM for hospitals that only partially met the screening metrics for OAIM (Table 1). Typically, this is intended for hospitals that lacked the necessary administration support. Rather than a 1-week visit by a NPLD team, the labor ward professionals from these hospitals are invited to OAIM sites during the NPLD training week to observe educational activities. The goal of OAS is to maximize the NPLD’s impact in hospitals with limited resources, especially personnel, and for the visiting Chinese professionals to take the knowledge acquired during the NPLD training sessions back to their own hospitals and implement it locally.

**Table 1. NPLD OAIM Site Screening Assessment**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Adequate anesthesia manpower for 24/7 obstetric anesthesia coverage.</td>
</tr>
<tr>
<td>2.</td>
<td>Multidisciplinary incentives for labor analgesia.</td>
</tr>
<tr>
<td>3.</td>
<td>Financial and administrative support from hospital administration.</td>
</tr>
</tbody>
</table>

NPLD = No Pain Labor & Delivery; OAIM = Obstetric Anesthesia Infrastructure Development Project.

It is very common in Chinese hospitals to use workload and performance to calculate health care providers’ monthly bonuses.
Table 2. Daily Themes in Obstetric Anesthesia Infrastructure Development Project

<table>
<thead>
<tr>
<th>Day</th>
<th>Daily theme</th>
<th>Examples of content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>Orientation day</td>
<td>• Anesthesiologists: their responsibilities, preanesthetic evaluation, analgesia record, postpartum follow-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Nurses: their responsibilities, obstetric flow sheet, postpartum care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Obstetricians: admission record</td>
</tr>
<tr>
<td>Monday</td>
<td>Mother safety day</td>
<td>• Preanesthetic assessment: IV access, monitors, left uterine displacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NPO status, aspiration risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Anesthesia cart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Epidural test dose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vasopressors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lipid emulsion resuscitation for local anesthetic systemic toxicity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coagulopathy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High-risk obstetric patients</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Baby safety day</td>
<td>• Intrauterine resuscitation, hypotension, uterine tachysystole, opioids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fetal heart rate monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Preterm, newborn resuscitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Breastfeeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Labor analgesia in early labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Initial neuraxial dose, epidural pumps, maintenance of epidural labor analgesia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Treatment options for breakthrough pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Labor analgesia for second-stage labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Management of failed epidural for cesarean delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Anesthesia for cesarean delivery, postpartum pain control</td>
</tr>
<tr>
<td>Wednesday</td>
<td>No pain day</td>
<td>• Labor analgesia in early labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Initial neuraxial dose, epidural pumps, maintenance of epidural labor analgesia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Treatment options for breakthrough pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Labor analgesia for second-stage labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Management of failed epidural for cesarean delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Anesthesia for cesarean delivery, postpartum pain control</td>
</tr>
<tr>
<td>Thursday</td>
<td>Satisfaction day</td>
<td>• Neurological complications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low back pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Nausea/vomiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fever</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Headache</td>
</tr>
<tr>
<td>Friday</td>
<td>Crash day</td>
<td>• Emergency cesarean delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cannot intubate and cannot ventilate, difficult airway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Massive postpartum hemorrhage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Maternal advanced cardiac life support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Obstetric anesthesia document and protocol</td>
</tr>
<tr>
<td>Saturday</td>
<td>Conference day</td>
<td>Topic coverage varied based on local needs and availability of experts on the team</td>
</tr>
</tbody>
</table>

Advanced Obstetric Anesthesia 1 + 2 + 3 Project

In 2013, the AOA123 was established as a follow-up program for hospitals that participated in the OAID project. The goal of the AOA123 project is to further promote labor analgesia and vaginal delivery in high-risk patients and to provide additional training in the management of obstetric emergencies.

To participate in the AOA123 program, hospitals first undergo a follow-up assessment to monitor the sustained effects of the OAID week (Table 3). The assessment occurs at least 1 year after the primary visit. The follow-up measures, initiated after 2012, were introduced after observing that some hospitals failed to sustain the agreed upon improved anesthesia protocols. The assessment includes appropriate allocation of both time and resources, and the documentation of the site’s commitment to the success of the project.

Table 3. NPLD AOA123 Site Screening Assessment

| 1. Existing 24/7 obstetric anesthesia coverage |
| 2. Neuraxial labor analgesia rate over 50%    |
| 3. Weekly multidisciplinary debriefing meetings with hospital administration present |

AOA123 = Advanced Obstetric Anesthesia 1 + 2 + 3 Project; NPLD = No Pain Labor & Delivery.

Table 4. Advanced Obstetric Anesthesia 1 + 2 + 3 Project

1. Proactive approach in high-risk parturients
   • Obstetric Anesthesia Preoperative Clinic/consultation
2. Rapid response teams
   • In situ, 5-minute emergency cesarean delivery simulation drills
   • Postpartum hemorrhage protocol
3. Care for high-risk pregnant women
   • External cephalic version for breech presentation
   • Trial of labor after cesarean delivery
   • Preeclampsia

Table 5. NPLD Documents

Guidelines
• Obstetric Anesthesia Responsibilities
• Midwife/L&D Nurse Responsibilities
• Obstetric Anesthesia Protocols

Documentation Forms
• Anesthesia
• Antepartum Anesthesia Evaluation Form
• Neuraxial Analgesia Record
• Postpartum Follow-up Form
• Nurse and Midwife
• Intrapartum Progress Form
• Obstetric
• Obstetric Admission Record
• Equipment Checklist
• Mobile Anesthesia Cart Par Level Checklist

NPLD = No Pain Labor & Delivery.

EDUCATIONAL MATERIALS

Documents and Protocols
To facilitate education, the NPLD team created 9 bilingual labor analgesia documents and epidural analgesia protocols (Table 5) based primarily on practice standards used at the Prentice Women’s Hospital, Northwestern University Feinberg School of Medicine, Chicago. All resources were reviewed and endorsed by NPLD members from multiple academic institutions and affiliated hospitals. Protocols were revised annually through discussion with NPLD participants to reflect current practice standards and adapt to changes at local hospitals in China.
The 9 bilingual documents for peripartum care include several guidelines and forms created to serve as templates for practice. Some deviation from the protocols was expected and allowed (e.g., because of local drug availability), as long as patient safety and quality of care were not compromised. The “Mobile Cart Par Level Checklist” was provided to emphasize the importance of standardization of anesthesia carts for 24/7 labor analgesia service. The protocols provided to the hospitals include obstetric anesthesia protocols for anesthesia care and professional responsibility protocols for anesthesia service and nursing care.

**Professional Books and Book Chapters**

The NPLD team has edited and translated a number of medical textbooks into Chinese to provide updated knowledge in the field to Chinese professionals. These include Lee Fleisher’s “Evidence-Based Practice of Anesthesiology” (first edition published in 2007 and second edition published in 2010) and “Chesnut’s Obstetric Anesthesia: Principles and Practice” (fourth edition published in 2013 and fifth edition in press). “Obstetric Anesthesia: Principles and Clinical Perspectives” is an original book written by core team members in 2012. In May 2016, NPLD will publish “Textbook of Establishing a Modern Labor & Delivery Suite.” Many book chapters and journal articles written by the NPLD core members have been published in China as well.

**Patient Education Books and Lectures**

As in many cultures, Chinese women are often expected to “suffer” for their babies’ well-being. Parturients are encouraged to bear labor pain and avoid systemic medications they believe detrimental to their unborn child. Few Chinese women are aware of neuraxial analgesia as a safe option. In addition, cesarean delivery is perceived by most Chinese women as safer and easier than vaginal delivery. Because of this perception, cesarean delivery is commonly performed without medical indication.

In 2010, with the goal of educating Chinese parturients and their family members about modern labor analgesia/anesthesia and Western obstetric advancements, Ling-Qun Hu, MD, translated “Easy Labor,” by William Camann into Chinese. In 2012, this was supplemented by “Painless Childbirth: You Must Know Your Side of the Story,” a collection of birth stories from Chinese women who delivered both inside and outside of China. These 2 books, intended for the lay public, were provided as an adjunct to childbirth lectures specifically created for expectant mothers at NPLD sites. The lectures allowed women and their families a chance to meet anesthesiologists and discuss their concerns regarding labor analgesia/anesthesia in the antepartum period.

**World Wide Web Resources**

Social media, both in China and in the United States, played a role in promoting NPLD and educating health care providers throughout the year. We established an official NPLD website that provides all the educational protocols and resources. We also have an NPLD WeChat group on China’s most popular group chat platform. NPLD members have presented articles on WeChat and answered questions about clinical practice several times a week since November 2014. Professional forums are also held on www.dxy.cn, China’s largest biomedical blog. A monthly webinar called “Modern L&D Virtual Lecture Hall” is also provided via YY Voice, a Chinese Web-based education application.

**IMPACT**

Between 2008 and 2015, >371 volunteers participated in NPLD from the United States, Belgium, Canada, Germany, Israel, and China. These individuals include physician anesthesiologists, obstetricians (including maternal-fetal medicine specialists), neonatologists, midwives, labor and delivery nurses, senior anesthesiology residents/fellows, interpreters, and other volunteers.

More than 200 lectures have been given as part of NPLD’s educational program. Participants of NPLD-cohosted weekend conferences have increased from <100 in 2008 to just under 3000 in 2015 (6 conference sites). In recent years, NPLD members have participated in up to 15 obstetric and obstetric anesthesia conferences annually. Approximately 300 attendees participate each month in each Modern L&D Virtual Lecture Hall.

The 31 participating hospitals (Table 6) care for a parturient population of approximately 500,000 annually. The OAID project was initiated at 25 hospitals in 22 cities from 2008 to 2015. The annual number of hospital sites visited increased from 1 in 2008 to 6 in 2015. Since 2014, 6 additional hospitals have participated in the OAID project.

Two of the participating hospitals offered routine obstetric anesthesia service before NPLD. At these 2 hospitals, the baseline rate of epidural anesthesia was >50%. As summarized in Table 6, 24 of the 31 NPLD-engaged hospitals (77%) achieved epidural labor analgesia rates >50%. Ten of the 11 NPLD-engaged hospitals that participated in the follow-up OA123 project advanced from providing simple labor epidural analgesia service to the full scope of obstetric anesthesia coverage.

Three impact studies have been completed. The first was conducted using data from the Shijiazhuang Obstetrics and Gynecology Hospital (2009–2011). This is a large urban maternity hospital in Hebei Province. As neuraxial labor analgesia rates increased from 0% to 33.5% of total deliveries with NPLD involvement, cesarean deliveries decreased from 41% to 34% (P = 0.002), the episiotomy rate decreased from 71% to 47% (P = 0.002), and the operative vaginal delivery rates remained unchanged (P = 0.92). The incidence of Apgar scores ≤3 decreased from 1.5% to 0.9% (P = 0.007). There were no in-hospital maternal deaths during

<table>
<thead>
<tr>
<th>Year started</th>
<th>Number of hospitals</th>
<th>Before NPLD</th>
<th>After NPLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>25</td>
<td>2 (8)</td>
<td>20 (80)</td>
</tr>
<tr>
<td>2014</td>
<td>6</td>
<td>0 (0)</td>
<td>4 (67)</td>
</tr>
</tbody>
</table>

| Total        | 31                  | 2 (6)       | 24 (77)    |

NPLD = No Pain Labor & Delivery.
the study period. The popularity of the program spread quickly through the local population and the monthly delivery volume increased from 757 at the beginning of the study in 2009 to 1056 at the end of the study in 2011, despite the fact that analgesia care is an out-of-pocket expense.

Similar increases in neuraxial labor analgesia use were documented in the second impact study, which included 15,415 deliveries from January 2009 to June 2011 at the Second Hospital of Wenzhou Medical University in Zhejiang Province. This hospital saw an increase in its monthly neuraxial anesthesia rate from 0% before the NPLD to 57% after the NPLD visit. In addition, significant decreases were observed in the overall rate of cesarean delivery (44.6%–42.5%), nonmedically indicated cesarean deliveries (13%–2.7%), and traumatic vaginal deliveries (including episiotomy and perineal laceration). Similar to the Shijiazhuang study, rates of operative vaginal deliveries and intrapartum cesarean deliveries remained unchanged. Increases in clinic visits, obstetric admissions, and total deliveries after NPLD suggest improved efficiency in clinical practice. A comparison of data from the first 3 months to the last 3 months of the post-NPLD period indicates that the initial improved clinical outcomes were sustained.

At the Weixian Renmin Hospital, a large general hospital in a rural area of Hebei Province, data from 19,577 deliveries were collected from June 2013 to April 2015. Based on our preliminary analysis, trends in this study are similar to those identified in the 2 previous studies. Monthly neuraxial analgesia rates increased from 5% in the first month of data collection to 83% by the final month in the study period. The monthly cesarean delivery and episiotomy rates decreased from 52% to 35% and 61% to 30%, respectively, during the same period. Introduction by the NPLD team of the revised ACOG guideline regarding the definitions of arrest of labor in the second stage in the presence of epidural analgesia was associated with decreases in the monthly rates of intrapartum cesarean delivery, as well as neonatal intensive care unit admissions (Fig. 1).

Tables 7 and 8 summarize these results from the impact studies conducted at 3 different types of hospitals (academic, municipal, and rural), based on data from approximately 55,000 parturients.

**DISCUSSION**

The most important lesson of NPLD is that a well-organized program can make a sustained impact on clinical practice and outcomes on a large scale. Successful global health initiatives, such as Unite for Sight, Operation Smile, and Operation Walk, have worked to address the needs of communities through direct help. Health care providers involved with these initiatives bring expertise, passion, and selflessness to their sites.

Leveraging the lessons of international volunteerism, new global health initiatives, such as the Kybele Inc. initiative in Ghana and the NPLD, focus on affecting community practice and improving clinical outcomes. The concept of teaching the community “to fish” instead of “giving them a fish” can create sustained change. This approach can achieve success only when the recipient community has the motivation, resources, and expertise to sustain the new protocols.

The Chinese hospitals visited by NPLD program were ready for change. System-wide changes at the national level in China have occurred in the field of peripartum medicine since the first NPLD visit (June 2008), likely spurred by the global initiative of the World Health Organization to improve maternal health (Millennium Development Goal 5). In 2011, a Chinese national mandate called for decreasing the cesarean delivery rate. In 2012, a breakthrough occurred with the establishment of a national billing code for labor analgesia by the National Development and Reform Commission (Number: 2012 4134). The Chinese Obstetric Anesthesia Practice Guidelines, first created in 2008, were revised in 2012.

In 2013, the standard procedures referenced in the Chinese National Medical Textbook Series were updated to fit definitions presented in the 2003 ACOG Practice Bulletin Number 49 (e.g., the definition of arrest of second-stage labor). In September 2014, Chinese obstetric practice guidelines were updated to reflect the ACOG Obstetric Care Consensus Series Number 1: Safe Prevention of the Primary Cesarean Delivery–March 2014. In September 2014, the “China Labor and Delivery Study” was initiated. It was headed by Jun Zhang, MD, PhD, well known for his work on the evaluation of labor progress for the US National Health Service. The study was designed to create labor curves specifically for Chinese parturients, who may labor at a different rate than parturients in the West.

---


NPLD is a goal-oriented, protocol-driven, and evidence-based educational program. The vision of NPLD is to sustain improved clinical outcomes. While all education tools have their applications and limitations, NPLD was careful to select scenarios and tools appropriate to the local setting. For example, obstetric anesthesia lectures, a commonly used teaching modality, may not be an effective method of teaching in a community with only limited access to obstetric anesthesia. Because Chinese anesthesiologists are skilled at neuraxial anesthesia (most cesarean deliveries in China are performed with epidural or spinal anesthesia), NPLD focuses on the acquisition of in-depth knowledge of applications and effectiveness of epidural labor analgesia in both low- and high-risk parturients. Similarly, the use of simulation training, crisis drills, and debriefings to strengthen teamwork skills, rather than lectures on protocols and regulations have proven to be very productive. We believe that customizing educational tools to enhance the obstetric anesthesia capabilities available at each hospital greatly influenced the success of NPLD.

Communities in which global health initiatives have been initiated often have logical safety concerns about advanced medical interventions introduced into their environments. Understandably, Chinese medical societies have concerns regarding safety of neuraxial labor analgesia in the Chinese community. Validating the acceptance and dissemination of updated clinical knowledge, concepts, and interventions within Chinese medical communities is one of the most important tasks of the NPLD. Thus, one of the primary milestones for NPLD was the publication of the first impact study data in 2012, which specifically addressed safety concerns from local Chinese health care professionals and provided evidence regarding certain “hot topics” in perinatal medicine.

**SUMMARY AND FUTURE**

In October 2015, the Chinese “one-child policy” ended abruptly after 35 years. This created a new challenge for the obstetric care of Chinese women. Women who previously underwent cesarean delivery may now elect to have a second child with the increased risk of peripartum uterine rupture or multiple cesarean deliveries.40 This new era of “second child” policy creates additional urgency for the local medical community to establish 24/7 obstetric anesthesia coverage to cope with the likely increase in women undergoing trial of labor after cesarean delivery.

The NPLD program has brought labor analgesia and better perinatal care to over 500,000 Chinese parturients since 2008. Once a critical number of sites progress through the AOA123 program, we believe that improved standards for obstetric anesthesia will become the Chinese standard of care and hence will be self-sustaining. Should that happen, NPLD will venture to other places in the world where women will benefit from improved obstetric and obstetric anesthesia care.

**DISCLOSURES**

Name: Ling-Qun Hu, MD.

Contribution: This author helped design the study, conduct the study, analyze the data, write the manuscript, and is the founder and executive director of NPLD.

Conflicts: Ling-Qun Hu reported no conflicts of interest.

Attestation: Ling-Qun Hu approved the final manuscript.
No Pain Labor & Delivery Impact on Clinical Outcomes in China

Name: Pamela Flood, MD.
Contribution: This author helped conduct the study, analyze the data, write the manuscript, and has participated in NPLD since 2012.
Conflicts: Pamela Flood is married to Dr. Steven Shafer.
Attestation: Pamela Flood approved the final manuscript.
Name: Yunping Li, MD.
Contribution: This author helped conduct the study, analyze the data, write the manuscript, and has been one of NPLD directors since 2010.
Conflicts: Yunping Li reported no conflicts of interest.
Attestation: Yunping Li approved the final manuscript.
Name: Weike Tao, MD.
Contribution: This author helped conduct the study, write the manuscript, and has been one of NPLD directors since 2011.
Conflicts: Weike Tao reported no conflicts of interest.
Attestation: Weike Tao approved the final manuscript.
Name: Peishan Zhao, MD, PhD.
Contribution: This author helped conduct the study, write the manuscript, and has been one of NPLD directors since 2012.
Conflicts: Peishan Zhao reported no conflicts of interest.
Attestation: Peishan Zhao approved the final manuscript.
Name: Yun Xia, MD, PhD.
Contribution: This author helped conduct the study, write the manuscript, and has been one of NPLD directors since 2010.
Conflicts: Yun Xia reported no conflicts of interest.
Attestation: Yun Xia approved the final manuscript.
Name: May C. Pian-Smith, MD, MS.
Contribution: This author helped conduct the study, write the manuscript, and has participated in NPLD since 2013.
Conflicts: May C. Pian-Smith reported no conflicts of interest.
Attestation: May C. Pian-Smith approved the final manuscript.
Name: Francis S. Stellaccio, MD.
Contribution: This author helped conduct the study, write the manuscript, and has participated in NPLD since 2010.
Conflicts: Francis S. Stellaccio reported no conflicts of interest.
Attestation: Francis S. Stellaccio approved the final manuscript.
Name: Jean-Pierre P. Ouanes, DO, MS.
Contribution: This author helped conduct the study, write the manuscript, and has participated in NPLD since 2012.
Conflicts: Jean-Pierre P. Ouanes reported no conflicts of interest.
Attestation: Jean-Pierre P. Ouanes approved the final manuscript.
Name: Fengling Hu.
Contribution: This author helped conduct the study, write the manuscript, and drafted the manuscript, as well as has participated in NPLD since 2013.
Conflicts: Fengling Hu reported no conflicts of interest.
Attestation: Fengling Hu approved the final manuscript.
Name: Cynthia A. Wong, MD.
Contribution: This author helped design the study, conduct the study, analyze the data, write the manuscript, and has participated in NPLD since 2008.
Conflicts: Cynthia A. Wong is the current Section Editor for Obstetric Anesthesiology for *Anesthesia & Analgesia*.
Attestation: Cynthia A. Wong approved the final manuscript.

**RESCUE NOTE**
Dr. Cynthia A. Wong is the Section Editor for Obstetric Anesthesiology for *Anesthesia & Analgesia*. This manuscript was handled by Dr. Steven L. Shafer, Editor-in-Chief, and Dr. Wong was not involved in any way with the editorial process or decision.

**REFERENCES**


