What does it take to get an established and effective but forgotten tool back into obstetric practice? In the case of nitrous oxide, it took a nurse-midwife.

Nitrous oxide, also called laughing gas, is a colorless gas initially synthesized by the chemist Joseph Priestley in 1772. In the late 1700s nitrous oxide was used recreationally to induce euphoria. It got the name laughing gas because users often laughed or giggled. In 1800, the dentist Humphry Davy noted that nitrous oxide produced analgesia, though this effect lasts only as long as the gas is being inhaled. In 1844, nitrous oxide was first introduced into dental practice to decrease the pain of tooth extractions.

Nitrous oxide use for laboring women really began in England in 1934 when Robert James Minnitt introduced the mechanism for self-administration. Today it is used by 60% to 75% of laboring women in countries such as the United Kingdom, Canada, Sweden, and New Zealand. Although laboring women use this gas extensively in other countries, nitrous oxide never gained recognition in the United States as an important agent for labor pain, that is until Judith Rooks, CNM, MPH, FACNM, came into the picture.

Twelve years ago, Rooks was the chair of a multidisciplinary steering committee, assembled by Maternity Center Association and the New York Academy of Science, tasked with developing systematic reviews and a symposium that would address the nature and management of labor pain. The Maternity Center Association had identified labor pain as a topic of great import to the 4 million women who give birth in the United States annually, but one that had significant variability in practice, controversy surrounding effective strategies, and uneven patterns of use geographically. In short, this was a perfect topic for their Maternity Wise program, which focused on promoting evidence-based maternity care.

Rooks did not leave a stone unturned. She reached out to midwives, obstetricians, anesthesiologists, statisticians, epidemiologists, and policymakers from all relevant fields. Her committee identified authors and supported the production of 12 systematic reviews on all aspects of labor pain that were presented at the Nature and Management of Labor Pain Symposium in May 2001. These reviews became seminal articles that were published in a May 2002 supplement of the American Journal of Obstetrics and Gynecology. As she started the process, she heard about nitrous oxide and how it was used in Europe. Rooks was intrigued to learn about this pain management option that was virtually unheard of in the United States, and she realized instantly that something that is well established in other developed nations bode investigation. So she looked for someone to write a systematic review on nitrous oxide.

The article about use of nitrous oxide was written by Mark Rosen, MD, an obstetric anesthesiologist at the University of California San Francisco (UCSF), which was one of the few places in the United States where nitrous oxide was used by laboring women. Dr. Rosen taught the midwifes at UCSF how to administer nitrous oxide, and today it is used by many of the women who give birth at that institution (Judith Bishop, CNM, MPH, MSN, oral communication, September 2011). However, Judith Rooks knew that renewed awareness of the incredible value of this analgesic by a few individuals who attended the symposium, an article in an obstetric journal, and use in 1 institution was not enough. Thus began her personal mission to make nitrous oxide an option for laboring women in the United States.

Rooks tackled the problem via multiple paths. As an epidemiologist, she knew that in order to ensure adoption of a new technique, research, practice, and policy needed to be hand-in-glove. She started with the research and after an extensive review she determined that nitrous oxide is both safe and effective. Her efforts to document the research supporting nitrous oxide use have culminated in her article published in this issue.

To reach out to those in practice, she wrote an editorial in this Journal and a commentary in Birth, introducing nitrous oxide. She encouraged and mentored the publication of the UCSF nitrous oxide protocol, which is now accessible as a template to others who want to begin using nitrous oxide in their institutions. Rooks also began talking to midwives, obstetricians, family practice physicians, and anesthesiologists throughout the United States and around the globe. She started an electronic mailing list about nitrous oxide (N2O during labor on Yahoo! Groups), which now has more than 200 active members. In addition to e-mail discussions in which clinicians share information and insights, Rooks and members of the list have built a repository of materials related to nitrous oxide such as articles and sample clinical guidelines. As interest has expanded, there is even a nitrous oxide Facebook page and articles in the mainstream media with titles such as “Not Just for the Dentist: Nitrous Oxide Returning to Delivery Rooms.”

On the policy front, Rooks proposed and then facilitated the development of an American College of Nurse-Midwives position statement supporting the use of nitrous oxide by laboring women. Currently, the Agency for Healthcare Research and Quality (AHRQ) is funding a systematic review on the use of nitrous oxide for laboring women about which the American Society of Anesthesiologists submitted comments. When professional organizations and federal government policy experts start paying attention to a technique, it gains real legitimacy. This legitimacy is a critical piece of the foundation that supports the introduction of a technique into obstetric practice.
In the case of nitrous oxide, the company that makes the portable machine needed to formulate the correct mix of 50% nitrous oxide and 50% oxygen stopped producing the equipment several years ago. Institutions that have nitrous oxide pumped into labor rooms along with oxygen and other gases do not have a problem, but those that need the portable machines are unable to purchase new equipment. Here again, Rooks stepped in to help. She has been in close communication with companies that want to offer nitrous oxide equipment for laboring women, and new models will soon be available. In the meantime, Rooks has been generous in providing information and advice to clinicians interested in nitrous oxide. Several US facilities are poised to offer nitrous oxide to laboring women as soon as new equipment is available.

This story is not just about nitrous oxide, it is also about how one affects practice via dedication, concerted effort, passion, and a comprehensive strategy that addresses multiple facets of a problem. The story of how nitrous oxide is being reintroduced for the benefit of women in the United States is significant. Rediscovery can be as important, if not more important, than the original discovery. But it is how that rediscovery is presented to the world that makes the difference and in this case, we thank Judith Rooks.

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REFERENCES