Birth, Bath, and Beyond: The Science and Safety of Water Immersion During Labor and Birth

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ABSTRACT

The 2014 objection to birth in water voiced by both the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists (ACOG) in *ACOG Bulletin #594* on immersion in water during labor and birth is nothing new. The Committee on Fetus and Newborn published the very same opinion in 2005, based on a case report that was published in 2002 in the journal *Pediatrics*. What has changed since 2002 is a growing body of evidence that reports on the safety and efficacy of labor and birth in water. This article reviews the retrospective literature on water birth and explains newborn physiology and the protective mechanisms that prevent babies from breathing during a birth in water.

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The recent objections to birth in water which were voiced by both the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists (ACOG, 2014) in *ACOG Bulletin #594* on immersion in water during labor and birth is nothing new. The joint bulletin, which was published in both the April *Pediatrics* and on the ACOG website, is a follow-up to previously published opinions on the use of warm water immersion during labor and birth. Pediatricians were first warned of the potential dangers of birth in water in an article published in the *Journal of the American Academy of Pediatrics* in 2002 (Nguyen, Kuschel, Reele, & Spooner, 2002). The current opinion of the Committee on Fetus and Newborn was first issued in 2005, restated in November 2012, and has not changed since it was first issued. What has changed since 2002 is a growing body of evidence that reports on the safety and efficacy of not only laboring in water but also actually giving birth in warm water.

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ACOG draws a distinction between these two events and has said in its opinion that "immersion in water during the first stage of labor may be associated with decreased pain or the use of anesthesia and a decreased labor duration." But it warns that there are no known benefits to either mother or

baby during the second stage of labor and cause for concern of serious harm.

There are many midwives, obstetricians, and pediatricians who are perplexed with the statement, including doctors such as Duncan Neilson, of the Legacy Health Systems in Portland, Oregon. Dr. Neilson is chair of the Perinatology Department and vice president of both Women's Services and Surgical Services at the Legacy Emanuel Hospital in downtown Portland.

In 2006, Dr. Neilson did an independent review of all the literature on water birth, including obstetric, nursing, midwifery, and pediatric. He concluded, "There is no credible evidence that water birth is a potential harm for either mothers or babies." He reported that most of the water-birth studies have been done and published in Europe with large numbers in retrospective analyses (Alderdice et al., 1995; Geissbuehler, Stein, & Eberhard, 2004; Gilbert & Tookey, 1999; Zanetti-Dällenbach, Lapaire, Maertens, Holzgreve, Hösli, 2006). What has been published in the United States is largely anecdotal and has involved very small numbers of case reports from home-birth or birth center transfers into a neonatal intensive care unit (NICU; Bowden, Kessler, Pinette, & Wilson, 2003; Nguyen et al., 2002; Schroeter, 2004). Dr. Neilson even pointed out that Jerold Lucy, MD, the editor of the *American Journal of Pediatrics*, put the following commentary in a sidebar in this research journal: "I've always considered underwater birth a bad joke, useless and a fad, which was so idiotic that it would go away. It hasn't! It should!" (Neilson, 2007).

The publication of such prejudicial statements makes it difficult for pediatricians to look at the European research without skepticism. Dr. Neilson concluded that American doctors were not getting the complete picture. After a comprehensive review of water-birth literature, Dr. Neilson concluded that water birth is a safe birth option that provides other positive obstetric outcomes. He helped set up a Legacy research committee, and the parameters for water-birth selection were created, using current recommended selection criteria followed by other Portland hospitals offering water birth. Hospital selection criteria strictly enforces a policy that includes a pregnancy that has reached term of at least 37 completed weeks and is a singleton with a head-down (cephalic) presentation with no visible signs of infection.

Upon Dr. Neilson's recommendations, the entire Legacy system has adopted water birth. The most recent hospital to begin water birth was Good Samaritan in Portland, which conducted their first water birth in February of 2014. Dr. Neilson is currently reviewing the statistical data on just more than 1,100 water births in the Legacy Health System and made the following comments in a recent interview.

> *The large-scale observation studies from other countries which ACOG cites (e.g., Geissbuhler et al., 2004) do show neonatal outcomes that are at least as good as, and often somewhat better than outcomes from conventional care, but this likely reflects the ability of care providers to select low risk patients rather than any benefit from the water immersion. The consistent valid point, which can be gleaned from observation studies, is that there seems to be no increased risk in these studies involving certified experienced birth attendants in adequate facilities with protocol-driven care paths (N. Duncan, personal communication, March 28, 2014).*

Dr. Neilson makes a valid point that women self-select and often follow the suggestions and experience of their providers. Garland (2011) discusses the process of how women choose to birth in water, in her book *Revisiting Waterbirth: An Attitude to Care*. In a large survey of practices of individual midwives, the rate of the use of water varied greatly from almost 100% for some and less than 10% for others. Why such variances? Garland explains that women who seek this type of care option are influenced by the comfort level of their individual providers. This theory was also evidenced in a 2002 audit of water-birth practices in 10 birth sites throughout the United Kingdom (Garland, 2002). The more water births taking place in a facility meant that the hospital staff and providers were comfortable with the practice and recommended it to every woman as an option, and those who were not comfortable with the practice discouraged women from staying in the water for birth.

Every day, Waterbirth International receives e-mails from women throughout the United States asking one simple question: "How can I have a water birth in my hospital?" Our first response is "how pregnant are you?" And then, if they are less than 30 weeks pregnant, we list the tasks that need to happen before a hospital can change policy and embrace using water for labor and birth. In the past 5 years,

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more hospitals have begun water-birth programs than in the previous 10 years. The current estimated number of U.S. hospitals offering water immersion as an option for both labor and birth is just lower than 10% of all maternity care facilities. Women in the United States and around the world are seeking a kinder, gentler way to birth their babies.

Women who are seeking water birth and undisturbed birth have usually considered the consequences of interference with the birth process. They may have read about the impact of early childhood trauma, including birth trauma, on the developmental neurobiology, endocrinology, immunology, and epigenetics of this new human being (Karr-Morse, 2010). Many women are not just looking for pain relief but a way to remain drug-free, relaxed, and with some control over the process of letting the baby out. Over the past three decades, I have assisted hundreds of women in the birth pool. I have observed closely, listened carefully, and recorded many actions and characteristics in mothers and their caregivers. I have heard many caregivers and mothers retell their stories to friends, to families, and to their babies. More than 2,500 women have completed surveys about their water-birth experience through Waterbirth International, often using the same words to describe how their babies responded after birth and in the months and years that followed (Harper, 2008). Is it just the water that caused these babies to be alert, calm, responsive, connected, present, and aware? The use of warm water immersion aids and assists the mother in feeling calm, relaxed, nurtured, protected, and in control, with the ability to easily move as her body and her baby dictate. From the mother's perspective, using water becomes the best way to enhance the natural process without any evidence of increased risk. A calm, relaxed mother is more likely to experience a calm, relaxed baby after birth.

The goal of the pediatrician and the goal of mothers who choose undisturbed birth is really exactly the same. They are both thinking of the baby and what the baby needs to enhance its quality of life from the very beginning.

A joint meeting of the Royal College of Obstetricians, the Royal College of Midwives, and the National Childbirth Trust in 2006 examined many different birthing methods and modalities. Their main question was "what would increase the normalcy of birth without increasing risk?" and the very first agreement that went into a joint statement was that access to water for labor and birth would accomplish that task (Alfirevic & Gould, 2006).

FRAMEWORK FOR MATERNITY SERVICES PROTOCOL

The U.K. National Health Service and the National Childbirth Trusts formed a Framework for Maternity Services that includes the following statements:

- Women have a choice of methods of pain relief during labor, including nonpharmacological options.
- All staff must have up-to-date skills and knowledge to support women who choose to labor without pharmacological intervention, including the use of birthing pools.
- Wherever possible, women should be allowed access to a birthing pool in all facilities, with staff competent in facilitating water births.

There is a concerted effort to educate midwives and physicians in all hospitals in the United Kingdom on the proper uses of birthing pools and safe water-birth practices. From the baby's perspective, there are benefits from an unmedicated mother who has a full complement of natural brain oxytocin, endorphins, and catecholamine flowing through her blood supply, which the baby receives and uses to aid his or her physiologic imperative to be born. The descent and birth of the baby is easier when the mother can move into any upright position where she can control her own perineum, ease the baby out, and allow the baby to express its primitive reflexes without anyone actually touching the baby's head. The birth process is restored to its essential mammalian/human nature.

PEDIATRIC CONCERNS

Pediatricians are most concerned with the potential risk of aspiration, hypothermia, and infection when babies are born in water.

Aspiration

The fear of aspiration is a strong deterrent to water birth for some providers and a grave concern for pediatricians and parents alike. When a baby is born,

everyone awaits that first cry, which signals that the newborn has emerged safely from the womb. The delay of that response is very stressful for most people. Others view the newly born baby in the water opening his eyes and stretching his limbs in awe and see a baby who is doing exactly what he did for 9 months and still completely supported by placental circulation but now is in a larger, expanded womb—a womb with a view. The focus on the breath and that first cry has overshadowed all the other mechanisms that happen in the first moments that welcome us to life on planet Earth. There are several mechanisms that prevent the baby from inhaling or gasping while it is still submerged in the water as the head is born and after the full body has slipped into the water. An understanding of these mechanisms is important to appraise the safety of water birth. It is also important to have knowledge of the triggers for newborn breathing and what takes place in the cardiovascular system as the baby transitions from fetal circulation to newborn circulation.

One of the most important triggers for breathing is the presence of gravity pushing equally on the face and stimulating the trigeminal nerve (the fifth cranial nerve) innervations around the nose and mouth. Human beings need a gravitational force of 14.7 lbs/sq. in., as well as the presence of oxygen and carbon dioxide molecules, to trigger the switch from fetal circulation to newborn circulation. Once the shunts in the heart (the foremen ovale and ductus arteriosus) close and highly oxygenated blood flows into the pulmonary arteries, the well-vascularized tissue around the alveoli fill with blood, and the fluid that occupies every one of the alveolar spaces (air sacs) is resorbed into the thick erect capillaries (Johnson, 1996a). The thick viscous fluid that was present in the lungs during fetal life will now increase the blood volume by as much as 20% (Mercer & Skovgaard, 2002).

Immediately after birth, the cardiac output to the lungs must increase from the 8% level in fetal life to a 45% level necessary for neonatal life and adult circulation. Therefore, some of the blood from the fetal "lung," the placenta, is needed by the neonatal lungs for draining of the fetal lung fluids and adequate expansion and recruitment of lung tissue. Immediate cord clamping eliminates the many benefits of placental transfusion and compromises lung expansion and function. The infant is left with only the blood that was in the body at the time of cord clamping, which is not adequate to create an increase in the circulatory

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bed at the same time that the infant's organs (lung, liver, kidney, skin, gut, and brain) begin to assume the functions that had been sustained by the placenta during fetal life (Mercer, Vohr, Erickson-Owens, Padbury, & Oh, 2010). In other words, the more blood that flows from the placenta into the newborn, the higher the blood volume. The more blood volume and the thicker the blood, the more fluids are able to leave the lung tissue. The many mechanisms that function to switch the newborn from fetal circulation to newborn status take place over the course of hours and sometimes days. Not all the fluids that were in the lungs prenatally are drawn out into the vascular circulation. The fluids that remain are drawn out of the lung tissue through the lymphatic system, which is stimulated over the following 72 hr by skin-to-skin placement, self-attachment, and breastfeeding. One of the many benefits of water birth is immediate and uninterrupted skin-to-skin contact. Water-birth providers have learned so much from observing what normal full-term healthy newborns do in the habitat between the breasts. The neonate who is placed skin-to-skin regulates all his systems very quickly but is usually extremely quiet. The absence of vigorous crying is not indicative of the absence of newborn breathing. Quiet stable newborn breathing happens often without a single peep out of the baby who is immediately placed in the habitat (Moore, Anderson, & Bergman, 2007; Mori, Khanna, Pledge, & Nakayama, 2010). This is frequently observed of babies who are born in water.

The presence of lung fluids in the alveolar spaces prenatally was explained by Dr. Paul Johnson, an Oxford University research physiologist, as one of several inhibitory factors that prevent the baby from gasping or taking a breath during the infant's brief contact with the water during a water birth. When he explained the mechanisms of newborn breathing at the First International Conference on Water Birth at Wembley Hall, London, in 1995, and said, "There are some things physiologically that are in favor of water birth," there was a collective nod of understanding from more than 1,100 participants (Johnson, 1996b). With this information, along with the other 15 lectures, more water-birth practices were established all over the United Kingdom and Europe. Dr. Johnson

went on to publish his explanations in the *British Medical Journal* in 1996 (Johnson, 1996a).

Two other inhibitory factors need to be examined. The first one involves fetal breathing movements, which take place 40% of the time in utero, from 10 weeks' gestation. At 24–48 hr before the onset of normal labor, the prostaglandin E2 levels rise in both mother and fetus. The mother's cervix softens, but the fetus slows the rate of active fetal breathing in an effort to conserve oxygen. After 4 cm of dilation, it is thought that the prostaglandin levels are much higher, preventing any fetal breathing movement from taking place from that point forward throughout the labor and birth process. It makes sense to think that an expansion of the intercostal muscles during the birth is not something that would aid in the expulsion of the fetus from the birth canal. Dr. Johnson explained further that if the muscles are inhibited from working, the fetus or newborn has no ability to gasp or inhale. The musculature that operates the lungs simply is offline during the birth—they are not functional.

A prominent theme in Dr. Johnson's work is the explanation of normal newborn mild hypoxia and how it prevents the neonate from taking a breath by causing a swallowing reflex. All newborns are born with mild hypoxia. It is expected. The mild hypoxia causes bradycardia, apnea (absence of breathing), and swallowing. The very first accomplishment on the long list of transitional activities for a newborn is to swallow the contents of the mouth. Presumably, the mouth is full of vaginal secretions, amniotic fluid, and other bacteria-laden secretions, which need to get into the gut to begin to colonize and prime the new digestive system with the right bacterial probiotics. Swallowing those fluids and clearing his or her own airway takes place before the first breath. Experienced providers of undisturbed birth, including water birth, often report that newborns will swallow then spit, cough, and perhaps sneeze before regular respirations are noticeable. When a baby's mouth is suctioned with either a bulb syringe or a DeLee trap, this act interferes with the mechanisms to introduce normal flora into the gut. Rather than enhancing the ability for the newborn to breathe, it may in fact disrupt breathing efforts (Carrasco, Martell, & Esto, 1997).

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Johnson's review of respiratory physiology suggests that in a nonstressed fetus, it is unlikely that breathing will commence in the short time that the baby's head is underwater (Johnson, 1996a). Johnson sees no reason to prevent this option being offered to women.

Hypothermia in Water-Born Babies

The thermal regulation abilities of the newborn are enhanced by delayed cord clamping, which will allow all the skin capillaries to fill, and improved by skin-to-skin contact (Mazurek et al., 1999). All water babies experience immediate and uninterrupted skin-to-skin contact. In my entire career as a home-birth midwife and doula, I had never placed a baby or witnessed a baby placed anywhere except skin-to-skin. Every water birth ends with the baby being placed upright, face to one side, on the mother's chest. A dry towel is sometimes used to gently wipe the face and head, and another one is placed over the baby's back. All observations of the newborn take place while the baby is transitioning in that space. The newborn brain is programmed to behave in a specific sequence and transition only in that space (Bergman, 2011; Moore et al., 2007). The infant does not need a hat, clothes, or a warmer. The mother's skin facilitates warming of the infant and leads to thermal stability better than any substitute mechanical warming unit (Conde-Agudelo, Belizan, & Diaz-Rossello, 2011). The warmth of the water (temperatures vary between 92 °F and 99 °F [33–37 °C]) aids in keeping the mother warm and comfortable. Ambient skin temperature is between 92 °F and 95 °F (33–35 °C). Water temperature should always be kept comfortable for the mother but not too hot. During labor, if the mother becomes overheated from higher water temperatures, the fetus will experience a transient increase in heart rate, which only resolves if the mother cools off. After the birth, the temperature of the water can be raised by adding more hot water. Mothers can stay in the water until the delivery of the placenta or leave the bath with baby still attached and deliver the placenta outside of the water.

Infection in Newborns Following Water Birth

In 1960, Dr. Siegel published a study in the *Journal of Obstetrics and Gynecology* entitled, "Does Bath Water Enter the Vagina?" Pregnant women were put into bathtubs that contained iodine-stained water. Before entering the bath, a sterile, starched white tampon,

without a string, was inserted into the vagina. After 15 min of soaking, the women left the bath, the tampons were removed, and not a single one was stained with iodine. Common advice from physicians at that time was to avoid bathing in the third trimester and definitely to not bathe while in labor or after membranes have ruptured. Dr. Siegel concluded,

> *Thus, the fear that bath water may infect a pregnant or puerperal woman is not founded on fact, since normally no water enters the vagina. Therefore, restrictions on bathing during and after pregnancy are not warranted on this basis alone. Moreover, this teaching represents another classic example of error.*

No relationship has been found between hydrotherapy and infections or an increase in admissions to special care nurseries. In Oregon, the Oregon Health and Science University (OHSU) has been teaching safe water birth in the nurse-midwifery education program since approximately 1999 when Sig-Linda Jacobson, one of the perinatologists on the staff who had completed a fellowship in England, where water birth was routine, worked with the midwives to create the guidelines that are still being used in that facility (Mack, Pechovnik, Andronici, Tallman, & Lowe, 2005). That OHSU program continues today without any evidence of added risk to the neonate.

A 1996 Scandinavian study of women with premature rupture of membranes and prolonged latency, in which part of the study group took baths once labor began and the rest labored conventionally, compared rates of infection in neonates following the births. The bath group had significantly lower rates of infection than the bed group, concluding that even with waiting for 72 hr for labor to begin, using hydrotherapy did not increase infection (Eriksson, Ladfors, Mattson, & Fall, 1996).

The subject of fecal matter in birth pools always comes up when infection risk during water birth is discussed. Dr. Rosenthal (1991) began offering water birth to clients at his free-standing birth center in Claremont, California, in 1992, after hearing a lecture by Dr. Michel Odent. Dr. Rosenthal, being one of the first U.S. board–certified obstetricians to embrace water birth, was often interviewed and asked about this. He explained in numerous interviews that the dilution effect of the water actually reduced the exposure to any harmful bacteria and then went on to explain that every baby needs to be exposed to the bacteria from the mother's vagina and rectum to create the proper microbial protection for the baby. He was 20 years ahead of his time when he stated that "the solution to pollution is dilution." Recent studies that looked at group B *Streptococcus* exposure to babies born in water revealed that the tendency was for less colonization of bacteria on the water babies compared to the land-born babies (Zanetti-Dällenbach et al., 2007).

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The bottom line in preventing infection and cross contamination in birth pools and equipment is to make everything either disposable or cleanable. Having infection control policies in place for all birth settings, even home births, is necessary to prevent serious infections from occurring, especially with multiuse birth pools and installed bath tubs.

THE AMERICAN ASSOCIATION OF BIRTH CENTERS POSITION STATEMENT

American Association of Birth Centers (AABC, 2013) states that there are currently 248 known birth centers in 37 U.S. states. The vast majority of birth centers offer water immersion for labor and birth with professional nurse-midwives who have taken special training in water birth. As a member of AABC, statistical data on births in their clinics can be submitted to, for inclusion in a larger national database, the Perinatal Data Registry.

An April 2014 statement was released by the board of directors of AABC in response to the ACOG opinion (AABC, 2014). Data for analysis were collected from a sample of 15,574 obstetrically low-risk women eligible for birth center birth at the onset of labor from January 1, 2007 to December 31, 2010. There were 3,998 water births in the sample. These data demonstrate that water birth, with careful selection criteria and experienced providers, does not negatively affect mothers or newborns.

Rates of newborn transfer to a hospital were lower following water birth (1.5%) than non–water birth (2.8%). Rates of adverse newborn outcomes (5-min Apgar score , 7, respiratory issues, presence of infection, and NICU admission) were each lower than 1.0% in the water-birth sample. The total rate of any respiratory issue was 1.6% in the babies born in water and 2.0% in those not born in water.

A Cochrane Collaboration review of water birth in three randomized controlled trials (RCTs) shows no research that demonstrates adverse effects to the fetus or neonate.

EUROPEAN RESEARCH

Highlights of the literature:

- Apgar scores were found to be unaffected by water birth (Aird, Luckas, Buckett, & Bousfield, 1997; Lenstrup, Schantz, Berget, Feder, & Roseno, 1987; Otigbah, Dhanjal, Harmsworth, & Chard, 2000; Rush, Burlock, & Lambert, 1996; Waldenstrom & Nilsson, 1992).
- One study found a decrease in 1-min Apgar scores exclusively in a subgroup of women who were in water after membranes were ruptured longer than 24 hr (Waldenstrom & Nilsson, 1992).
- A consensus of researchers found that water birth had either no effect or reduced rates of cesarean surgery and operative delivery (Aird et al., 1997).
- No studies of water birth have found an increase in rates of maternal or fetal infection (Eriksson et al., 1996; Geissbühler & Eberhard, 2000; Rush, Burlock, & Lambert, 1996; Waldenstrom & Nilsson, 1992).

Statistically, water birth leads to increased relaxation and maternal satisfaction, decreased perineal trauma, decreased pain and use of pharmaceuticals, and decreased labor time (Benfield, Herman, Katz, Wilsonv, & Davis, 2001; Cluett, Pickering, Getliffe, & Saunders, 2004; Eckert, Turnbull, & MacLennan, 2001; Mackey, 2001; Rush et al., 1996; Thöni, Mussner, & Ploner, 2010).

COCHRANE COLLABORATION FINDINGS

A Cochrane Collaboration review of water birth in three randomized controlled trials (RCTs) shows no research that demonstrates adverse effects to the fetus or neonate (Burns, Boulton, Cluett, Cornelius, & Smith, 2012). Other studies that were not RCTs were included in the conclusion:

> *There is no evidence of increased adverse affects [sic] to the fetus or neonate or woman from laboring in water or water birth. However, the studies are variable and considerable heterogeneity was detected for some outcomes. Further research is needed.*

AMERICAN ACADEMY OF PEDIATRICS' COMMITTEE COMMENTARY

Despite the research, the 2005 commentary of the AAP Committee on Fetus and Newborn (the one on which the current ACOG statement is based) raised concerns regarding the safety of hospital water birth. The committee commentary was not a study itself but rather an opinion generated on the review of research.

A review of the commentary and the sources cited revealed irregularities. The commentary often paraphrases text from the references, redacts crucial words and sentences from the texts, and sometimes reinterprets the authors' conclusions. Anecdotal case studies were referenced without being part of an empirical study. Here are some examples:

Committee text: "All mothers used water immersion during labor, but only a limited and unspecified number of births occurred under water. 2 infants required positive pressure support, but little additional data were provided."

From cited reference: "100 births occurred under water. Only 2 infants out of 100 needed suction of the upper respiratory tract and a short period of manual ventilatory support" (Odent, 1983).

Committee text: "Alderdice et al. performed a retrospective survey of 4494 underwater deliveries by midwives in England and Wales. They reported 12 stillbirths or neonatal deaths."

From cited reference: "Twelve babies who died after their mothers laboured or gave birth in water, or both, in 1992 and 1993 were reported. None of these cases was reported to be directly related to labour or birth in water" (Alderdice et al., 1995).

Committee text: "In a subsequent survey of 4032 underwater births in England and Wales, the perinatal mortality rate was 1.2 per 1000 live births (95% confidence interval: 0.4–2.9) and the rate of admission to a special care nursery was 8.4 per 1000 live births (95% CI: 5.8–11.8). The author of this survey suggested that these rates may be higher than expected for a term, low-risk, vaginally delivered population."

From cited reference: "4032 deliveries (0.6% of all deliveries) in England and Wales occurred in water. Perinatal mortality was 1.2/1000 (95% confidence interval 0.4 to 2.9) live births; 8.4/1000 [Note: they left out the second CI 5.8–11.8] live births were admitted for special care. No deaths were directly attributable to delivery in water. . . ." (Gilbert & Tookey, 1999)

The reference also provides that the U.K. perinatal mortality and special care admission rates for conventional birth ranged from 0.8 to 4.6 per 1,000 for perinatal mortality and from 9.2 to 64 per 1,000 for special care admission—significantly higher than those using water birth.

Nowhere in the cited reference can the statement be found that "these rates may be higher than expected for a term, low-risk, vaginally delivered population." In fact, the study results reflect no adverse effect on fetal outcomes and certainly not an increase in fetal mortality and special care admissions (Alderdice et al., 1995).

Finally, the committee commentary acknowledges the findings of the Geissbühler and Eberhard (2000) study:

> *A prospective observational study compared underwater birth with births using Maia-birthing stools and beds. Although underwater birth was associated with a decreased need for episiotomies and pain medication as well as higher APGAR scores and less cord blood acidosis in newborns, the birthing method was determined by maternal preference, and potential confounding variables were not analyzed.*

The committee does not elaborate on which confounding variables they feel are of concern. It appears this supportive study was automatically discredited without a reason.

Although the AAP is committed to patient safety and evidence-based medicine, this commentary's conclusions that hospital water births pose greater risk than other hospital birth options for low-risk and carefully screened patients are unfounded.

STUDYING WATER BIRTH

In 1998, I copied all the medical journal articles about water birth that had been published to date and sent the labeled and categorized studies to the practice committee of ACOG. In the cover letter accompanying the rather weighty binders, I asked the committee if they would review the literature and issue an opinion about actual birth in water. The letter that arrived a few months later from Stanley Zinberg, MD, head of the practice committee, stated, "Until there are randomized controlled trials of large numbers of women undergoing birth in water, published in peer reviewed journals in the U.S., the committee is not able to issue an opinion."

Randomized studies of water birth are difficult to design and implement for one major reason: Women want to choose their own method of childbirth and should be able to change their mind at any point of labor. Because of this, it is difficult to design a randomized controlled study without crossover between control and study group. A 2005 randomized trial that was set up in a Shanghai, China hospital was abandoned because the hospital director realized after only 45 successful water births that to continue the study would be unethical. Women want to choose their method of birth, and many more women wanted to choose water birth than the study would have allowed. The original goal was to study 500 water births, but the results of those first 45 were so good they abandoned the research project and continued their commitment to offering water birth to any woman who wanted one. The latest communication from the Changning Hospital indicates that they have facilitated well more than 5,000 water births.

RCTs may be few; however, many retrospective and prospective case-controlled studies have been performed, primarily in European countries with a long history of water birth. In reviewing published studies, a comparison of the safety of water birth to conventional births among low-risk patients can be made. The evidence reveals that the option of water birth is safe and, looking at certain parameters, has superior outcomes.

CONCLUSION

Water birth is an option for birth all over the world. World-renowned hospitals, as well as small hospitals and birthing centers, offer water birth as an option to low-risk patients. Although some members of the AAP feel otherwise, the Cochrane review and many other studies find no data that supports safety concerns over water birth.

Women increasingly are seeking settings for birth that honor their ability to give birth without intervention. Water birth increases their chances of attaining the goal of a natural birth without intervention.

My two water babies are active, thriving adult men in their late 20s. I kept notes on their development and intelligence, but my biased information needs to be joined with other collective data. We need robust cooperative research in maternity care, including sharing worldwide water-birth data and follow-up studies on the children. Water birth continues to provide a platform for maternity care

reform, discoveries about consciousness and birth, and a new respect for fetal and newborn development. Water birth takes us beyond our previous limitations of knowledge about newborn adaptation and challenges us to move from our comfort zone. When undisturbed water birth is embraced by a hospital system, other practices change as well. Cords are left uncut; babies are put into the habitat and left skin-to-skin without separation for any reason; women are encouraged to eat and drink liberally, to walk, and to be upright in or out of the water. The use of water immersion does, indeed, normalize all birth once the basic principles are embraced.

Physicians and midwives are skilled providers who are being trained in water-birth techniques, safety concerns, and infection control procedures. Once a provider has training and personal experience with water birth, it suddenly becomes routine not to "do" anything at a birth except observe, protect, and support. Patients return for subsequent births when they know they are being cared for with respect for their birth experience. I hear this phrase repeatedly from almost every woman who has given birth in water: "I could never imagine giving birth any other way."

Obstetricians and midwives can offer a full complement of services in any setting, even in the "security-oriented" environment of the hospital. Increasing the number of low-risk women attracted to these facilities will reduce their exposure to higher risk, interventive practices. Carefully managed water birth is both an attractive and low-risk birth management tool that can provide healthy patients with nonpharmacological options in hospital facilities while not compromising their safety.

German philosopher Arthur Schopehauer (1788–1860) is quoted as saying, "All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident." In some parts of the United States, the benefits of water birth are accepted as self-evident, and it is promoted as being easier for mothers and better for babies. In other places, water birth is still being ridiculed. We know that water birth is being violently opposed by those who do not understand all the benefits that undisturbed birth provides for both mother and baby. Women want safe, satisfying births where the provider is a powerful guardian of the experience, trusting the woman and her baby to unfold at their own pace in their own way, including the use of water throughout the birth process.

Despite Dr. Lucy's statement, water birth is not a fad, especially when it is mandated as an available option for all women in the United Kingdom and practiced worldwide in more than 90 countries.

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