

Waterbirth International

A nonprofit public benefit education association.

PO Box 1400 Wilsonville, OR 97070 USA

Ph: 503-673-0026 FAX: 503-673-0029

www.waterbirth.org info@waterbirth.org

We want to provide you with some useful information that you can share with your clients and colleagues. Following are some commonly asked questions about waterbirth and their answers.

What is the temperature of the water? Water should be maintained at a temperature that is comfortable for the mother, usually between 92-99 degrees Fahrenheit. Water temperature should NEVER exceed 101 degrees because it could lead to overheating which can cause the baby's heart rate to go up. It is a good idea to have plenty of water to drink and cold cloths for mother's face and neck. A cool facial mist from a spray bottle is a welcome relief for some mothers. If the water temperature drops during the birth do not worry about whether the baby will be compromised. Babies do better at birth with lower temperatures.

When should women get into the water? A woman should be encouraged to use the labor pool whenever she wants. Some providers feel that if a mother gets into the water before her contractions are long and strong and close together, the water may relax her enough to slow or stop the labor altogether. This is not always the case. Each laboring mother must be evaluated individually. The first hour to hour-and-a-half of relaxation in the labor pool is usually the best and can often help a woman achieve complete dilation even in that short amount of time and even for first time mothers. Offer the water as a trial, making sure it is the right temperature and that she uses it no less than 30 minutes on the first go around. It is useful to get out and actively move after about an hour and a half and stay out for an hour and then get back in the water for another hour and a half. All the physiologic benefits of water immersion start all over again the second time around.

What prevents a baby from taking a breath under the water? There are several factors that prevent a baby from inhaling water at the time of birth. These inhibitory factors are normally present in all newborns. The baby in utero is oxygenated through the umbilical cord via the placenta, but practices for future air breathing by moving his intercostal muscles and diaphragm in a regular and rhythmic pattern from about 10 weeks gestation on. The lung fluids that are present are produced in the lungs and similar chemically to gastric fluids. These fluids come out into the mouth and are normally swallowed by the fetus. There is very little inspiration of amniotic fluid in utero. 24-48 hours before the onset of spontaneous labor the fetus experiences a notable increase in the Prostaglandin E2 levels from the placenta which cause a slowing down or stopping of the fetal breathing movements (FBM).¹ With the work of the

¹ Johnson, Paul (1996) Birth under water – to breathe or not to breathe. *British Journal of Obstetrics and Gynecology*, Vol. 103, pp.202-208

musculature of the diaphragm and intercostal muscles suspended, there is more blood flow to vital organs, including the brain. You can see the decrease in FBM on a biophysical profile, as you normally see the fetus moving these muscles about forty percent of the time. When the baby is born and the Prostaglandin level is still high, the baby's muscles for breathing simply don't work, thus engaging the first inhibitory response.

A second inhibitory response is the fact that babies are born experiencing acute hypoxia or lack of oxygen. It is a built in response to the birth process. Hypoxia causes apnea and swallowing, not breathing or gasping. If the fetus were experiencing severe and prolonged lack of oxygen, it may then gasp as soon as it was born, possibly inhaling water into the lungs.² If the baby were in trouble during the labor, there would be wide variabilities noted in the fetal heart rate, usually resulting in prolonged bradycardia, which would cause the practitioner to ask the mother to leave the bath prior to the baby's birth.

Another factor which is thought by many to inhibit the newborn from initiating the breathing response while in water, is the temperature differential. The temperature of the water is so close to that of the maternal temperature that it prevents any detection of change within the newborn. This is an area for reconsideration after increasing reports of births taking place in the oceans, both now and in eras past. Ocean temperatures are certainly not as high as maternal body temperature and yet the babies that are born in these environments are reported to be just fine. The lower water temperatures do not stimulate the baby to breathe while immersed.

One more factor that most people do not consider, but is vital to the whole waterbirth and aspiration issue, is the fact that water is a hypotonic solution and lung fluids present in the fetus are hypertonic. So, even if water were to travel in past the larynx, they could not pass into the lungs based on the fact that hypertonic solutions are denser and prevent hypotonic solutions from merging or coming into their presence.

The last important inhibitory factor is the Dive Reflex and revolves around the larynx. The larynx is covered all over with chemoreceptors or taste buds. The larynx has five times as many as taste buds as the whole surface of the tongue. So, when a solution hits the back of the throat, passing the larynx, the taste buds interpret what substance it is and the glottis automatically closes and the solution is then swallowed, not inhaled.³ God built this autonomic reflex into all newborns to assist with breastfeeding and it is present until about the age of six to eight months when it mysteriously disappears. The newborn is very intelligent and can detect what substance is in its throat. It can differentiate between amniotic fluid, water, cow's milk or human milk. The human infant will swallow and breathe differently when feeding on cow's milk or breast milk due to the Dive Reflex.

² Fewell, JE, Johnson, P (1983) Upper airway dynamics during breathing and during apnea in fetal lambs. *Journal of Physiology* Vol 339, pp 495-504

³ Harding, R., Johnson, P., McClelland, M. (1978) Liquid sensitive laryngeal receptors in the developing sheep, cat, and monkey. *Journal of Physiology*, Vol 277, pp 409-422

All of these factors combine to prevent a newborn that is born into water from taking a breath until he is lifted up into the air.

When should the baby be lifted out of the water after the birth? Here in the US, practitioners all bring the baby out of the water within a second or two after the birth. There is no physiological reason to leave the baby under the water for any length of time, however, there is mounting evidence that the baby needs time to "regroup" and should only be brought to the surface when it begins making kicking motions with its legs. The kicking indicates that it is initiating the crawl to the belly for attachment and breastfeeding. Allowing the baby to complete this rotation and attachment process is vitally important and should not be interrupted. We encourage all mothers to reach down and lift their own baby out of the water, making eye contact in the process. Physiologically, the placenta is supporting the baby with oxygen during this time, but it cannot be predicted when the placenta begins to separate and stops the flow of oxygen to the baby. The umbilical cord pulsating is no guarantee that the baby is receiving enough oxygen. The safe approach is to lift the baby, without hurrying, preferably by the mother, into waiting arms.

What does cause the baby to start breathing? As soon as the newborn senses a change in the environment from the water into the air, there is a complex chain of chemical, hormonal and physical responses, resulting in the baby breathing. Water born babies are sometimes slower to initiate this response due to the fact that their whole body is exposed to the air at the same time, not just the caput or head as in a dry birth. Many midwives report that water babies stay just a little bit bluer longer, but their tone and alertness are just fine. It has even been suggested that water born babies be given the first APGAR scoring at one minute thirty seconds, not at one minute, due to this adjustment.

There are several things that happen all at once for the baby. The shunts in the heart are closed; fetal circulation turns to newborn circulation; the lungs experience oxygen for the first time; and the umbilical cord is stretched causing the umbilical arteries to close down. Nursing and medical schools taught their students for years that the first breath was dependent on the pressure of the passage through the birth canal and then a reflexive opening of the compressed chest creating a vacuum. That action has no bearing on newborn breathing whatsoever. There is no vacuum created. The newborn who is born into water is protected by all the inhibitory mechanisms mentioned above and is suspended and waiting to be lifted up out of the water and into mother's waiting arms.

All the fluids that are present in the lung alveoli are automatically pushed out into the vascular system from the pressure of pulmonary circulation, thus increasing blood volume for the newborn by 1/5th or 20%. The lymphatic system absorbs the rest of the fluids through the interstitial spaces in the lung tissue. The increase of blood volume is vital for the baby's health. It takes about six hours for all the lung fluids to disappear.⁴

⁴ Karlberg, P. et al. (1987) Alteration of the infant's thorax during vaginal delivery. *Acta Obstetrica Gynecol Scandinavia*. Vol. 41, p 223

When we look back at the analysis of the statistics of babies born in water it proves that these inhibitory factors are more than theories. A study conducted in England between 1994 and 1996, and published in 1999, reports on the outcomes of 4032 births in water. Perinatal mortality was 1.2 per 1000, but no deaths were attributed to birth in the water. Two babies were admitted to special care for possible water aspiration.⁵ From 1985 to 1999, it is estimated that there have been well over 150,000 cases of waterbirth worldwide. There are no valid reports of infant deaths due to water aspiration or inhalation. In the early days of waterbirth a baby was reported as dying from being born in the water. This particular newborn death was caused not by aspiration, but by asphyxiation due to leaving the baby under the water for more than fifteen minutes after the full body was born. At some point the placenta detached from the wall of the uterus and stopped the flow of oxygen to the baby. When the baby was taken out of the water, it did not begin breathing and could not be revived. On autopsy the baby was reported to have no water in the lungs and its death was attributed to asphyxia.⁶

How is the baby monitored during a water birth? The manufacturers of monitoring equipment and hand held dopplers have all developed water proof varieties of monitoring equipment. In a typical water birth the baby's heart tones are listened to every thirty minutes during the first stage and after every pushing contraction or every 15 minutes during second stage. Many hospitals now have waterproof telemetry units, which they use in the bath.

How can I support a woman to have a water birth at my local hospital? Waterbirth International diligently works with couples who want to use warm water during their births in a hospital environment. Hospitals are more cooperative today than ever before as more and more women start asking for what they want. Many couples start the process by inquiring if they can bring in a portable pool kit for labor. It takes three ingredients to make a hospital change their practices and start offering either water immersion therapy during labor and possibly waterbirth. First you need a motivated mother, one who is determined and will not take "no" for an answer. Second, she needs a willing provider, be it nurse midwife or physician. And last, but usually the most important on the list, is a cooperative nurse manager. The nurse manager of a busy labor and delivery unit makes or breaks an attempt to have a portable pool brought in. She needs to communicate the mothers' wishes effectively to many different department heads from engineering, infection control, OB staff, nursing staff, administration, risk management. If she doesn't see the need or have the time to deal with each of these areas, there is usually no way around it. But, if she is approached from a no nonsense factual place, and provided with the tools she needs to be an advocate, there is a very good possibility that it will happen. Your job is to help your client do research, give her our phone number and website and encourage her that it can be done.

⁵ Gilbert, R, Tookey, P, (1999) Perinatal mortality and morbidity among babies delivered in water: surveillance study and postal survey. *British Medical Journal* Vol 39, 21 August pp 483-487

⁶ Personal interviews (1989) Barbara Harper