



MANA AND CFM POSITION STATEMENT ON WATER IMMERSION DURING LABOR AND BIRTH

Introduction

Midwives in home and birth center settings focus on supporting and safeguarding normal physiologic birth processes. Increasingly, worldwide evidence demonstrates that normal physiologic birth and skin-to-skin contact in the moments after birth are optimal for the health of mother and baby¹⁻³ (see footnote). Water immersion in labor and birth can facilitate normal physiologic birth by offering pain relief, privacy, comfort, warmth and mobility to the mother^{4,5} and is associated with increased maternal satisfaction with the birth experience⁶⁻⁸. Immediate skin-to-skin connection between mother and baby born in water promotes newborn thermoregulation⁹ and facilitates bonding^{8,10-15}. The Midwives Alliance of North America (MANA) and Citizens for Midwifery (CfM) support ongoing access to water immersion during labor and birth across all birth settings.

Evidence for the Safety of Water Immersion During Labor and Birth

Numerous peer-reviewed studies have examined the use of water immersion during birth, collectively suggesting no evidence of increased neonatal morbidity, including low Apgar score, NICU admission, or neonatal injury¹⁶⁻²³. Previous studies also suggest that water immersion during birth is not associated with an increase in maternal morbidity such as vaginal tears, infection and hemorrhage^{22,24,25}. “Maternal & Newborn Outcomes Following Immersion During Waterbirth: The MANA Statistics Project 2004-2009” by Marit L. Bovbjerg PhD, MS, Melissa Cheyney PhD, CPM, LDM and Courtney Everson MA, PhD²⁶ was published in the *Journal of Midwifery and Women's Health* January 20, 2016. This is the largest study ever published on this topic, and the first large cohort study reporting outcomes following waterbirth in a U.S. population. The study included over 18,000 births at home and in birth centers with midwives, 35% of which were waterbirths. Findings confirm previous evidence that water immersion during birth is not associated with harm to newborns. Rates of neonatal transfers to the hospital or other hospitalization in the first six weeks of life were comparable between the waterbirth group and the non-waterbirth group. Best neonatal outcomes in this study were among babies born in water, suggesting that midwives used water immersion appropriately by

Footnote: A note on language: we use the terms “mother” and “woman” throughout this document despite the fact that people who do not identify as women or mothers also give birth. This is because the studies referred to here did not control for gender or maternal identity, and those researchers were studying mothers and women, in particular. Where it was logical or could be extrapolated from the research, gender neutral phrasing has been used.

facilitating exit from the water when indicators of difficulty or distress were present. The authors also reported no increased incidence of postpartum transfer for a maternal indication and no increased risk of maternal infection, however they did see an 11% increased risk of vaginal tears, the majority of which were minor.

Benefits of Water Immersion for Mother and Baby

Water immersion during labor and birth is associated with a number of benefits for both mothers and babies. Mothers who use water immersion report feeling relaxed, involved in decision-making, and being more in control ^{5, 8, 27}. In Baxter ⁶, one client stated, "I felt more relaxed in the pool and the atmosphere was great;" another reported, "I felt so relaxed and in control ..."; another stated, "... although I hadn't intended to deliver in the pool I now can't imagine giving birth any other way, it was so much more comfortable than being on a bed." Mothers also report a high perception of pain relief with use of water immersion, and in one study 86% of women reported that they would use water immersion in a subsequent birth ⁸.

Specific benefits of water immersion during labor and birth include the following:

For mothers

- Increased comfort and mobility ^{5, 12, 15, 28 - 30}
- Decreased sensation of pain ^{6, 7, 12, 18 - 19, 24, 30 - 48}
- Promotion of relaxation, and decreased cortisol levels ^{5, 8, 12, 28, 30, 48 - 49}
- Decreased blood pressure ^{8, 12, 30, 34, 48, 50 - 51}
- Increased oxytocin and endorphin levels ^{12, 15, 28, 36, 49, 52}
- Decreased duration of labor ^{7, 12, 28, 36, 43, 48 - 49, 52 - 58}

For babies

- Better oxygenation during labor ^{12, 20, 59}
- Easier descent and rotation through the pelvis ^{12, 30, 60 - 65}
- Promotion of immediate and sustained skin-to-skin contact ^{8, 10 - 15}
- Decreased disruption of newborn transition and attachment ^{8, 10 - 13, 15, 66}

In addition, because water immersion facilitates normal physiologic birth, it may also be associated with other beneficial health outcomes for mother and baby, including decreased need for intervention during labor and reduced incidence of surgical/instrumental delivery ⁶⁷.

Research has demonstrated significant differences in birth outcomes for nonwhite populations ^{68, 69}; for example, African Americans are four times more likely to die from pregnancy-related complications ⁷⁰, two times more likely to experience preterm birth ⁷¹ and three times more likely

to give birth to a low birth weight infant⁷¹. The majority of research on waterbirth has not focused on differences in outcomes by race or ethnicity; however, according to Jennie Joseph⁷², LM, CPM, founder of The JJ Way® and the National Perinatal Task Force, and CEO of Commonsense Childbirth, Inc., “Given the persistent disparities in health outcomes regarding increased maternal morbidity and mortality in communities of color in the US, water labor and birth provide another important tool that reduces the likelihood of interventions. Therefore, laboring and birthing in water can lead to improved outcomes by reducing unnecessary procedures and supporting physiologic birth, a potential lifesaver for women of color and their babies.” The International Center for Traditional Childbearing⁷³ further advises that “Women of color experience disproportionate rates of infant mortality, regardless of their educational and economic status. Contributing causes include the higher rate of stress that women of color experience. Laboring and birthing in water can create a calming effect and reduce anxiety. Therefore, women of color should be offered and supported in their choice to labor and birth in water.”

Consumer Choice and Shared Decision Making

Shared decision making and informed consent/refusal are central principles of midwifery care⁷⁴⁻⁷⁸, and are increasingly recognized in health care policy in the U.S.⁷⁸. Shared decision making is:

... the collaborative process that engages the midwife and client in ongoing verbal and written communication about treatment options. This dynamic process incorporates scientific evidence, clinical expertise, and the client’s preferences and values to determine the plan of care. The process of shared decision making culminates with informed consent, which can be revisited over time⁷⁸.

Shared decision making should play a central role in the decision to use water immersion for labor and birth, and this decision should be made in the context of the client's overall care plan. Midwives and clients should discuss the client’s preferences and values, along with the midwife's experience, comfort, and clinical recommendations regarding water immersion. Clients interested in water immersion during labor and birth should choose a midwife who has a high degree of comfort and experience with the use of water immersion, since evidence suggests this may insure better outcomes for mother and baby^{4, 80, 81}.

Factors that Promote Safety and Success

There are several factors and practice principles that enhance safety and success in waterbirth. Harper^{4, 15, 82} and Nutter et al.⁹ provide practice recommendations based on available evidence and clinical pearls of wisdom, including the following:

Clients who want to labor or birth in water, who are considered lower-risk, and who are educated about the risks and benefits, are considered good candidates for waterbirth.

A client's ability to easily enter and exit the water, or to be assisted from the water at any point, is an important safety factor. Clients with high Body Mass Index should have access to water immersion if they choose as long as there is sufficient help or a mechanism available to facilitate expedient entry into and exit from the water.

Water temperature is best kept at or below 100 degrees F⁸³ to reduce risk of maternal fever and fetal hyperthermia. The mother may choose to labor in cooler water, however water temperature for birth should be warm enough for baby to maintain optimum core temperature and should be monitored frequently while the newborn remains in contact with the water.

Blood borne pathogen screening, universal precautions, and thorough tub and equipment cleaning are important infection control practices. Equipment should be cleaned with antibacterial solutions effective against HIV, Hepatitis B and C, rinsed and dried according to manufacturer directions before refilling or relining with a new pool liner. Attention to water quality and freshness are also important in reducing infection risk. The Bovbjerg et al.²⁶ study as well as several studies in the Nutter et al.⁹ review indicate no difference in maternal infection between waterbirth and non-waterbirth. The risk of neonatal infection was low and NICU admissions show no difference between waterbirth and non-waterbirth.

Women laboring in water through second stage should be monitored with a waterproof doppler as frequently as they would be for non-waterbirth.

Normal neonatal physiology and the infant dive reflex allow infants to be safely born completely underwater. Babies are not stimulated to breathe until they experience gravity and have room air on their faces. Babies receive all their needed oxygen via the pulsing cord for several seconds following birth. During the birth, the baby's face should be completely submerged and not exposed to cooler water or air to reduce the risk of aspiration; the baby's face needs to be lifted out of the water once birth of the body is completed. If the client changes position during delivery, and is above the water level, it is advised to stay out of the water for the remaining delivery of the baby.

Normal physiologic third stage can be managed in the water per the needs or preferences of the client and midwife. If active management is required then assisting the client out of the water is recommended.

Midwives should be aware and prepared that third stage may take longer in water because even after baby is brought to the surface, cords take longer to stop pulsing. Ideally cords should be allowed to stop pulsing prior to clamping and cutting, allowing for a gentle and normal physiologic newborn transition and complete transfer of neonatal blood supply to the baby.

To reduce the chance of cord avulsion (tearing), providers should assess cord length and avoid tension when bringing the baby to the surface. The ability to quickly assist the mother to stand up to bring the baby with a short cord above the surface of the water is important. Cord clamps should be readily available.

Loose nuchal cords can be resolved as the baby is born into the water.

Thermoregulation of the baby can be achieved through immediate skin to skin on the client's chest with partial submersion of the baby in the warm water. Drying the baby's head will help reduce heat loss.

Be aware that babies may be slower to breathe, cry, or pink up during a waterbirth due to a slower transition. The midwife will watchfully monitor other signs of normal newborn transition (such as heart rate, tone, grimace) and respond quickly to any indicators of distress.

Research indicates that there is either an equal or reduced rate of blood loss and postpartum bleeding in waterbirth compared to non-waterbirth. Water clarity can be helpful in assessing blood loss. Nutter et al.⁹ recommends assisting the woman from the pool if her legs cannot be clearly seen.

During waterbirth, babies normally experience uninterrupted skin-to-skin contact that helps to facilitate breastfeeding. However, to further assist breastfeeding, allow baby to do the breast crawl after the client and baby have exited the water. This can be done even if the baby has had an initial feed in the water.

A significant factor in increasing success and safety for waterbirth is the experience and comfort level of the midwife. It is important for the midwife to be educated and knowledgeable about maternal and newborn norms in relation to labor and birth in water.

Conclusion

Of births attended by midwives in hospitals and birth centers in the U.S., between 15-64% of mothers used water immersion during labor, and between 9-31% used water immersion during birth⁵. In the MANA Stats study, Bovbjerg et al.,²⁶ 35% of 18,000 women who gave birth at home and in birth centers with midwives delivered in water. This level of use suggests that women consider water immersion a valuable option for labor and birth. Current research suggests that water immersion during labor and birth is safe for mothers and babies, and provides benefits to both^{81, 26}. MANA and CfM support the use of water immersion during labor and birth, and believe that it should be made available to birthing families across all birth settings. MANA and CfM encourage all care providers to become educated about the safe use of water immersion during labor and birth, and to engage in a shared decision making process when discussing the option of water immersion with their clients.

References

1. Crenshaw, J. (2007). Care Practice #6: No Separation of Mother and Baby, With Unlimited Opportunities for Breastfeeding. *J Perinat Educ*, 16 (3), 39–43.
2. Crenshaw, J. (2014). Healthy Birth Practice #6: Keep Mother and Baby Together— It's Best for Mother, Baby, and Breastfeeding. *J Perinat Educ*, 23(4), 211–217.
3. Phillips, R. (2013). Uninterrupted Skin-to-Skin Contact Immediately After Birth. *Newborn and Infant Nursing Reviews*, 13(2), 67-72.
4. Harper, B. (2012). In Deep: Seven Secrets of Successful Water Birth. *Essentially MIDIRIS*, 3 (5), 32-37.
5. American College of Nurse Midwives (ACNM). (2014). Position Statement: Hydrotherapy During Labor and Birth. In Division of Standards and Practice, Clinical Documents Section, Retrieved from <http://www.midwife.org/acnm/files/ccLibraryFiles/Filename/000000004048/Hydrotherapy-During-Labor-and-Birth-April-2014.pdf>
6. Baxter, L. (2006). What a Difference a pool makes: Making choice a reality. *British Journal of Midwifery*, 14 (6).
7. Cluett, E.R. & Burns, E. (2009). Immersion in water in labour and birth. *Cochrane Database Syst. Rev.* (2), doi: 10.1002/14651858.CD000111.pub3.
8. Richmond, H. (2003). Women's experience of waterbirth. *Pract Midwife*, 6(3), 26-31.
9. Nutter, E., Shaw-Battista, J. & Marowitz, A. (2014). Waterbirth Fundamentals for Clinicians. *Journal of Midwifery and Women's Health*, 59 (3), 350-354.
10. Kamayani, D. (1989). Waterbirth: A European perspective. *Journal of Midwifery*, 34 (4), 190-192.
11. Lichy, R., & Herzberg, E. (1993). The Waterbirth Handbook. *United Kingdom: Gateway Books*.
12. Mackey, M.M. (2001). Use of water in labor and birth. *Clinical obstetrics and gynecology*, 44(4), 733-749.
13. Veltman, L., & Doherty, D. (2013). Safety and underwater birth-what every risk manager should know. *J Healthc Risk Manag*, 32 (4), 16-24.
14. Davey, M.A., & Gibson, K.L. (2014). PD.02 Intervention in labour and early breastfeeding outcomes. *Arch Dis Child Fetal Neonatal Ed*, 99, A81. doi:10.1136/archdischild-2014-306576.231
15. Harper, B. (2014). Birth, Bath, and Beyond: The Science and Safety of Water Immersion During Labor and Birth. *J Perinat Educ*, 23 (3), 124–134.
16. Alderdice, F., Renfrew, M., Marchant, S., Ashurst, H., Hughes, P., Berridge, G., & Garcia, J. (1995). Labour and birth in water in England and Wales. *BMJ*, 310 (6983), 837.
17. Gilbert, R. E. & Tookey, P.A. (1999). Perinatal mortality and morbidity among babies delivered in water: surveillance study and postal survey. *BMJ*, 319 (7208), 483-487.
18. Otigbah, C. M., Dhanjal, M.K., Harmsworth, G., & Chard, T. (2000). A retrospective comparison of water births and conventional vaginal deliveries. *Eur J Obstet Gynecol Reprod Biol*, 91(1), 15-20.
19. Zanetti-Dallenbach, R. A., Holzgreve, W. & Hösli, I. (2007). Neonatal group B streptococcus colonization in water births. *International journal of gynaecology and obstetrics*, 98 (1), 54-55.
20. Chaichian, S., Akhlaghi, A. Rousta, F., and Safavi, M. (2009). Experience of water birth delivery in Iran. *Arch Iran Med*, 12(5), 468-471.

21. Mollamahmutoglu, L., Moraloglu, O., Ozyer, S., Su, F.A., Karayalçın, R., Hançerlio lu, N., Uzunlar, O., & Dilmen, U. (2012). The effects of immersion in water on labor, birth and newborn and comparison with epidural analgesia and conventional vaginal delivery. *J Turk Ger Gynecol Assoc*, 13 (1), 45-49.
22. Menakaya, U., Albayati, S., Vella, E., Fenwick, J., & Angstetra, D. (2013). A retrospective comparison of water birth and conventional vaginal birth among women deemed to be low risk in a secondary level hospital in Australia. *Women Birth*, 26 (2), 114-118.
23. Henderson, J., Burns, E.E., Regalia, A.L., Casarico, G., Boulton, M.G. & Smith, L.A. (2014). Labouring women who used a birthing pool in obstetric units in Italy: prospective observational study. *BMC Pregnancy Childbirth*, 14, 17.
24. Geissbuehler, V., Stein, S., & Eberhard, J. (2004). Waterbirths compared with landbirths: an observational study of nine years. *J Perinat Med*, 32 (4), 308-314.
25. Dahlen, H. G., Dowling, H., Tracy, M., Schmied, V., & Tracy, S. (2013). Maternal and perinatal outcomes amongst low risk women giving birth in water compared to six birth positions on land. A descriptive cross sectional study in a birth centre over 12 years. *Midwifery*, 29 (7), 75
26. Bovbjerg, M., Cheyney, M., and Everson, C. (*In Press*). Maternal and Newborn Outcomes Following Waterbirth: The MANA Statistics Project 2004-2009 Cohort (n=18,343). *Journal of Midwifery and Women's Health*, January 21, 2016. ed.
27. Tournaire, M. & Theau-Yonneau, A. (2007). Complementary and Alternative Approaches to Pain Relief During Labor. *Evid Based Complement Alternat Med*, 4 (4), 409–417.
28. Brown L., and Eugene, O.R. (1982). Therapeutic effects of bathing during labor. *J Nurse Midwifery*, 1, 13–16.
29. Edlich, R.F., Towler, M.A., Goitz, R.J., Wilder, R.P., Buschbacher, L.P., Morgan, R.F., and Thacker, J.G. (1987). Bioengineering principles of hydrotherapy. *J Burn Care Rehabil*, 8 (6), 580-584.
30. Ohlsson, G., Buchhave, P., Leandersson, U., Nordstrom, L., Rydhstrom, H., and Sjolin, I. (2001). Warm tub bathing during labor: maternal and neonatal effects. *Acta Obstetricia et Gynecologica Scandinavica*, 80, 311–314.
31. Gradert, Y., Hertel, J., Lenstrup, C., Bach, F.W., Christensen, N.J., AND Rosen, H. (1987). Warm tub bath during labor. Effects on plasma catecholamine and beta-endorphins. *Acta Obstet Gynecol Scand*, 66, 681–683.
32. Jepson, C. (1989). Water—can it help childbirth? *Nurs Times*, 47, 74–75.
33. Napierala, S. (1994). Water Birth. A Midwife's Perspective. *Westport CT: Bergin & Garvey*.
34. Cammu, H., Clasen, K., Van Wetteren, L., and Derde, M. (1994). 'To bathe or not to bathe' during the first stage of labor. *Acta Obstetricia et Gynecologica Scandinavica*. 73, 468–472.
35. Rush, J., Burlock, S., Lambert, K., Loosley-Millman, M., Hutchison, B., & Enkin, M. (1996). The effects of whirlpool baths in labor: a randomized controlled trial. *Birth*, 23, 136–143.
36. Arid, A., Luckas, M., and Buchett, W. (1997). Effects of intrapartum hydrotherapy on labour related parameters. *Australian and New Zealand Journal of Obstetrics and Gynecology*, 37 (2), 137–142.
37. Milner, I. (1998). Water births for pain relief in labor. *Nurs Times*, 1, 38–40.
38. Brown, L. (1998). The tide has turned: audit of waterbirth. *British Journal of Midwifery*, 1, 264-268.

39. Hartley, J. (1998). The use of water during labor and birth. *Midwives*, 1, 366-369.
40. Garland, D. (2000). Waterbirth: An Attitude to Care. 2nd ed, *Books for Midwives*, Oxford.
41. Garland, D., and Jones, K. (2000). Waterbirth: supporting practice with clinical audit. *MIDIRS Midwifery Digest*, 10, 333-336.
42. American Academy of Pediatrics (AAP) and American College of Obstetricians and Gynecologists (ACOG) (2014). Immersion in Water During Labor and Delivery. Retrieved from <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Immersion-in-Water-During-Labor-and-Delivery>
43. Pagano, E., De Rota, B., Ferrando, A., Petrinco, M., Merletti, F., & Gregori, D. (2010). An economic evaluation of water birth: the cost-effectiveness of mother well-being. *J Eval Clin Pract*, 16 (5), 916-919.
44. da Silva, F.M.B., De Olivera, S.M.J.V., & Nobre, M.R.C. (2009). A randomised controlled trial evaluating the effect of immersion bath on labour pain. *Midwifery*, 25 (3), 286–294.
45. Maude, R.M. & Foureur, M.J. (2007). It's beyond water: Stories of women's experience of using water for labour and birth. *Women and Birth*, 20, 7-24.
46. Moneta, J., Okninska, A., Wielgos, M., Przybos, A., Szymusik, I., & Marianowski, L. (2001). Patient's preferences concerning the course of labor. *Ginekologia Polska*. 72 (12), 1010–1018.
47. Thoeni, A., Zech, N., Moroder, L., & Ploner, F. (2005). Review of 600 water births. Does waterbirth increase the risk of neonatal infection? *Journal of Maternal-Fetal and Neonatal Medicine*. 17 (5), 357–61.
48. Cluett, E.R. & Burns, E. (2014). Immersion in water in labour and birth. *Cochrane Database Syst. Rev.* (2), doi:10.1002/14651858.CD000111.pub3.
49. Odent, M. (1983). Birth Under Water. *Lancet*, 24, 1476–1477.
50. Taha, M. (2000). The effects of water on labour: a randomised controlled trial [thesis]. *Rand Afrikaans University, Johannesburg*.
51. Goodlin, R., Hoffman, K., Williams, N., & Buchan, P. (1984). Shoulder-out immersion in pregnant women. *J Perinat Med*, 12, 173–177.
52. Church, L. (1989). Water birth: One birthing center's observations. *J Nurse Midwifery*, 34, 165–170.
53. Ginesi, L., & Niescierowicz, R. (1998a). Neuroendocrinology and birth 1: stress. *British Journal of Midwifery*, 6 (10), 659–663.
54. Ginesi, L., & Niescierowicz, R. (1998b). Neuroendocrinology and birth 2: The role of oxytocin. *British Journal of Midwifery*, 6 (12), 791–796.
55. Benfield, R.D., Herman, J., Katz, V. L., Wilson, S. P., & Davis, J. M. (2001). Hydrotherapy in labor. *Research in Nursing & Health*, 24, 57–67.
56. Eckert, K., Turnbull, D., & MacLennan, A. (2001). Immersion in water in the first stage of labor: A randomized controlled trial. *Birth*, 28 (2), 84–93.
57. Cluett, E.R., Pickering, R.M., Getliffe, G., & Saunders, N.J.S.G. (2004). Randomised controlled trial of labouring in water compared with standard of augmentation for the management of dystocia in first stage of labour. *BMJ*, 328 (7435), 314–320.
58. Thöni, A., Mussner, K., & Ploner, F. (2010). Water birthing: Retrospective review of 2625 water births. Contamination of birth pool water and risk of microbial cross-infection. *Minerva Ginecologica*, 62 (3), 203–211.

59. Harper, B. (2000). Waterbirth basics. From newborn breathing to hospital protocols. *Midwifery Today Int Midwife*, (54), 9 – 15 & 68.
60. Waldenstrom, V., & Nilsson, C. (1992). Warm tub bath after spontaneous rupture of the membranes. *Birth*, 2, 57–63.
61. Burn, E., & Greenish, K. (1993). Water birth. Pooling information. *Nurs. Times*, 89 (8), 47–49.
62. Teschendorf, M.E., & Evans, C.P. (2000). Hydrotherapy during labor: An example of developing a practice policy. *The American Journal of Maternal/Child Nursing*, 25 (4), 198-203.
63. Doniec-Ulman, I., Kokot, F., Wambach, G., & Drab, M. (1987). Water immersion-induced endocrine alterations in women with EPH gestosis. *Clin Nephrol.*, 28 (2), 51-55.
64. Simkin, P., & Bolden, A. (2004). Update on nonpharmacologic approaches to relieve labor pain and preventing suffering. *Journal of Midwifery & Women's Health*, 49, 489-504.
65. Stark, M.A., Rudell, B., & Haus, G. (2008). Observing position and movements in hydrotherapy: a pilot study. *J Obstet Gynecol Neonatal Nurs.*, 37 (1), 116-122.
66. Ashmore, S. (2001). Implementing skin-to-skin contact in the immediate postnatal period. *MIDIRS Midwifery Digest*, 11(2), 247-250.
67. American College of Nurse Midwives (ACNM), Midwives Alliance of North America (MANA) and National Association of Certified Professional Midwives (NACPM). (2013). Supporting Healthy and Normal Physiologic Childbirth: A Consensus Statement. Retrieved from [http:// mana.org/research/ normal-physiologic-birth](http://mana.org/research/normal-physiologic-birth)
68. Midwives Alliance of North America (MANA). (2015). Hormonal Impacts of Health Disparities on Birth Outcomes. Retrieved from <http://mana.org/blog/Hormonal-Impacts-Health-Disparities-Birth-Outcomes>
69. Molnar, S. (2015). Racial Disparities in Birth Outcomes and Racial Discrimination as an Independent Risk Factor Affecting Maternal, Infant, and Child Health: An Executive Summary of Existing Research. Retrieved from <http://mana.org/pdfs/Executive-Summary-Race-2015.pdf>
70. Tucker, M.J., Berg, C.J., Callaghan, W.M., & Hsia, J. (2007). The Black-White disparity in pregnancy-related mortality from 5 conditions: differences in prevalence and case-fatality rates. *Am J Public Health*, 97(2), 247-251.
71. Collins, J.W., David, R.J., Handler, A., Wall, S., & Andes, S. (2004). Very low birthweight in African American infants: the role of maternal exposure to interpersonal racial discrimination. *Am J Public Health*, 94(12), 2132-2138.
72. Joseph, J. (2016). Personal communication.
73. Monroe, S.M. (2016). Personal communication.
74. Midwifery Education and Accreditation Council (MEAC). (2014). Curriculum Checklist of Essential Competencies. Retrieved from <http://meacschools.org/wp-content/uploads/2014/12/Curriculum-Checklist-of-Essential-Competencies-rev-2014.pdf>
75. North American Registry of Midwives (NARM). (2015). NARM Certification Application. Instructions for Comprehensive Skills, Knowledge, and Abilities Essential for Competent Midwifery Practice, Verification Form 201a, 201b, and 201c. Retrieved from <http://narm.org/pdffiles/AppForms/Form201a.pdf>

76. Midwives Alliance of North America (MANA). (2014). Midwives Alliance Core Competencies. Retrieved from <http://mana.org/pdfs/MANACoreCompetenciesFINAL.pdf>
77. Citizens for Midwifery. (1996). Midwives Model of Care Brochure. Available via Citizens for Midwifery. Copyright Midwifery Task Force. Retrieved from <http://cfmidwifery.org/mmoc/define.aspx>
78. North American Registry of Midwives (NARM). (n.d.). Shared Decision Making and Informed Consent. Retrieved from <http://narm.org/shareddecisionmaking/>
79. Elwyn, G., Frosch, D., Thomson, R., Joseph-Williams, N., Lloyd, A., Kinnersley, P., Cording, E., Tomson, D., Dodd, C., Rollnick, S., Edwards, A., and Barry, M. (2012). Shared Decision Making: A Model for Clinical Practice. *Journal of General Internal Medicine*, 27 (10), 1361-1367.
80. American Association of Birth Centers (AABC) (2014). *Position Statement: Immersion in Water during Labor and Birth*. Retrieved from http://c.ymcdn.com/sites/www.birthcenters.org/resource/collection/46992E86-D0A4-476E-8B09F5ECE203B16E/AABC_Position_Statement_-_Immersion_in_Water_during_Labor_and_Birth.pdf
81. Dekker, R. (2014). Evidence on the Safety of Water Birth. *Evidence Based Birth: Giving birth based on best evidence*. Retrieved from <http://evidencebasedbirth.com/waterbirth/>
82. Harper, B. (2015). Personal Communication to the MANA Documents Committee
83. Geissbuehler V, Eberhard J, Lebrecht A. Waterbirth: water temperature and bathing time - mother knows best! *Journal of Perinatal Medicine*. 2002;30(5):371–378. doi:10.1515/JPM.2002.058