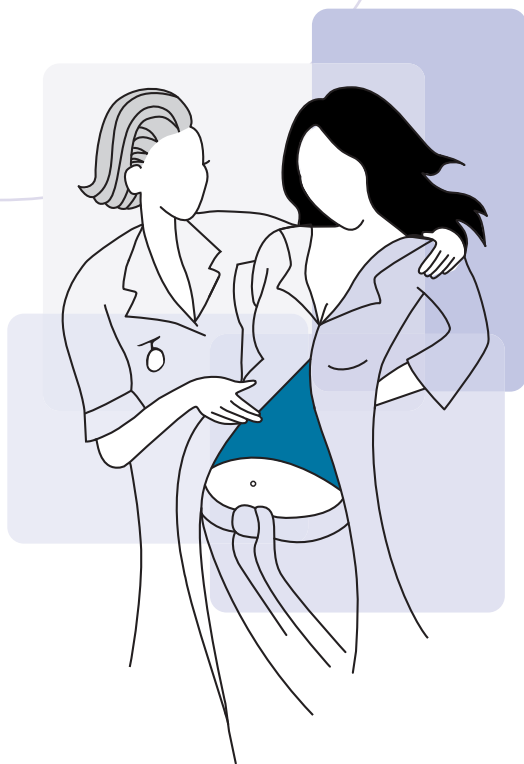


## The use of water during childbirth

Since the early 1980s use of immersion in water during labour and birth has been increasingly promoted to enable women to relax, help them cope with pain, and maximise their feelings of control and satisfaction<sup>1-4</sup>. In 1992 the House of Commons Health Committee recommended all hospitals provide the option of a birthing pool where practicable<sup>5</sup>. Currently few women give birth in water but the option of immersion or showering during the first stage of labour is commonly available.<sup>6-8</sup>



This leaflet is based on the best available research evidence

Although problems have arisen which have been attributed to water use, the results of most formal evaluations have not clearly associated water use with harmful outcomes for mother or baby<sup>4,9-13</sup>. The lack of robust evidence of harm or benefit means that childbearing women and health practitioners alike are subject to conflicting opinion about the usefulness and safety of using water, particularly for birth<sup>14,15</sup>.

However, a recent observational study over a nine year period concluded that *'waterbirth was associated with low risks where obstetric guidelines were followed'*<sup>16</sup>.



At present in the UK there is no reliable measurement of the rate of birth in water. A national survey of maternity units in the UK in 2002 found that 63% (216/342) had a birthing pool<sup>8</sup>; 67% (228/342) reported having at least one midwife trained to provide support for women giving

birth in water and 36% (121/342) said that at least half of the midwives working in their unit were trained to support birth in water.

## How is water used during labour?

Water use ranges from informal, for example when a woman in early labour decides to get into her bath at home before going to hospital, to formal use in a specially designed birthing pool. Informal use in a domestic bath or shower is often initiated by a woman herself to help her cope at home before her labour is well established. Formal use implies either that a woman has actively chosen to use water as part of her plan for labour and/or childbirth or that a health professional, usually a midwife, has suggested use during established labour.

## Why water use is promoted

Use of immersion in water during childbirth has largely been driven by pregnant and birthing women<sup>17</sup> and supported by midwives. During the first stage of labour it is advocated to shorten labour and help a woman relax and cope with contractions, feel more in control, and to reduce intervention by health professionals<sup>3,18-21</sup>. During the second stage, proponents use it to allow perineal tissues to stretch spontaneously, birth to occur with minimum intervention, and to provide the baby with a gentler transition into extra-uterine life. Expectant management of the third stage is likely if a woman is in water.

## Limitations on water use

Many health professionals consider that water use during the first stage of labour in uncomplicated pregnancy is unlikely to harm the mother or baby<sup>22,23</sup>, whilst others have concerns about water use at any point in labour<sup>14</sup>. Local clinical guidelines may restrict water use to women considered at 'low' obstetric risk<sup>7</sup>, and other aspects of care may be prescribed, for example when and how to monitor the temperature of the water; the degree of cervical dilatation at which to begin its use<sup>24</sup>, and whether the immersion is considered safe for all stages of labour<sup>6,25</sup>.

Problems associated with possible risk of infection or cross infection caused by amniotic fluid, blood, and faeces have been described<sup>26-28</sup> and some hospitals have restricted use of birthing pools to women who have tested HIV negative during pregnancy<sup>29</sup>. However, at a multi-disciplinary consensus meeting held in London in 1996, it was agreed that mandatory HIV testing for prospective users of birthing pools could be an extreme reaction to the perceived risks and that high standards of pool hygiene would be an appropriate way forward<sup>30</sup>. Local infection control guidelines should cover the use of water pools<sup>25,31</sup> and procedures to minimise risk of cross infection<sup>13,32</sup>.

It has been suggested that high water temperature can cause serious changes in feto-maternal haemodynamic regulation and fetal thermoregulation<sup>33</sup>. It has been reported that fetal tachycardia can be reduced by cooling the water<sup>34</sup> and most providers and clinical guidelines specify a temperature range within which the water should be maintained during the first and second stage of labour<sup>7,35</sup>.

The prospect of a woman giving birth in water can cause anxiety about how to deal with unexpected emergencies such as shoulder dystocia, the need to avoid the baby inhaling water, or being unaware that the umbilical cord has been severed<sup>11</sup>. Despite the fact that it denies women choice about birth, one response has been to limit water use to first stage only<sup>6</sup>. Development of agreed clinical protocols to deal with unexpected complications<sup>25</sup> and providing training which allows staff to achieve relevant competencies is key to enabling real choice for women about use of water.

There are theoretical risks of increased blood loss, retained placenta, or water embolism, and professional advice is often to conduct the third stage out of water<sup>25</sup>. Because water adds to the difficulty of estimating blood loss accurately, it has been proposed that blood loss would be more appropriately estimated as being either more or less than 500ml<sup>36</sup> and that the overall physical condition of the woman should be used as the most important indicator to assess the impact of any bleeding<sup>37</sup>.

In summary, although not universally accepted, first stage water use is less controversial than immersion for the second or third stage of labour<sup>22,23,38</sup>.

## The research evidence

The effects of water use during the first stage of labour on maternal and fetal outcomes have been evaluated in several randomised controlled trials<sup>4,9,10,12,13,39</sup> with sample sizes ranging from 60 to 1239<sup>34</sup>. The use of water has been shown to reduce the rate of augmentation<sup>40</sup>; however, no trial has been large enough to measure the effect of water use on important neonatal outcomes such as perinatal death or other serious neonatal or maternal morbidity. In addition, there has often been significant cross-over between study groups<sup>4,12</sup>, reducing the likelihood of identifying clear differences between women allocated to water use and those not.

A systematic review of eight trials<sup>41</sup> indicated a statistically significant reduction in the use of pain relief with no such significant difference in the rate of operative deliveries or in neonatal outcomes. It concluded that while the use of water in the first stage of labour can be of benefit to some women, there is no evidence at present to support or not support a woman's choice to give birth in water.

Retrospective comparison has been made of women who have used water with those who have not<sup>42,43</sup>. However, there are considerable difficulties in interpreting such studies because of the possibility that the results are inherently biased. In the same way, findings of cohort studies which suggest benefit for water use in terms of pain relief and increased rate of cervical dilatation<sup>44-47</sup>, or those which indicate differences in rates of maternal and neonatal infection<sup>48-50</sup>, are also open to criticism.

A recent study<sup>16</sup> compared neonatal and maternal morbidity and mortality for spontaneous singleton births that took place in water or on land. This was an observational study over a nine year period and data were obtained through standardized

questionnaires for 9,518 births, of which 3,617 were waterbirths and 5,901 landbirths. Statistically significant differences were identified between the two groups; women who gave birth using water were less likely to suffer serious perineal trauma, use no analgesia and have a lower blood loss than women in the landbirth group. Maternal and neonatal infection rates were the same for both groups, but more landbirth babies had neonatal complications requiring transfer to an external NICU. During the study, there were neither maternal nor neonatal deaths related to spontaneous labor. The authors acknowledge the potential bias that could arise from the self-selection issue but argue that this is well accounted for in the analysis. They conclude that waterbirths are associated with low risks for both mother and child when obstetrical guidelines are followed.

Another study<sup>51</sup> based in a centre for low risk women was a retrospective case review over a five year period of 1355 births in water. When compared with land births over a corresponding period, women who gave birth in water had significantly fewer episiotomies with no evidence of a corresponding rise in lacerations, a reduction in the length of the first stage of labour, no increase in the risk of acquired infection or aspiration pneumonia and considerably lower levels of analgesia use. Neonatal condition assessed by arterial cord blood pH, base excess and birth weight showed no differences. The authors conclude that this represents a realistic option for women at low risk of complications.

Many reports about water use are case series<sup>1,20,52-62</sup> and focus on perceived benefits of water use for the mother, her baby and birth attendant. These include shorter labour<sup>52</sup>, less use of pharmacological analgesics<sup>46,53</sup>, less intervention by care givers<sup>19</sup>, lower rate of perineal trauma<sup>60-62</sup>, and increased satisfaction with the experience of labour and birth<sup>54</sup>. By contrast, some case reports have highlighted serious problems such as fetal overheating<sup>33,34</sup>, neonatal sepsis<sup>28</sup>, near drowning<sup>63</sup> or death<sup>64</sup>.

Overall, reviews of the evidence<sup>21,23,65,66</sup> conclude that appropriately large-scale research is still required to evaluate rigorously the physiological effects<sup>13</sup>, clinical outcomes, and economic impact of water use.



## What we don't know

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The current evidence about water use remains quite heavily dependent on case series and comparison studies that include varying sized samples. Therefore, reliable evidence about efficacy and effectiveness is still equivocal<sup>67</sup>.

Outstanding issues which require evaluation include:

- **is water use causally associated with an increase in perinatal mortality or serious perinatal morbidity?**
- **at what dilatation should a woman be advised to begin water use?**
- **does the size or shape of the water container affect outcomes?**
- **if water has an effect on important physical/psychological outcomes for mothers or babies, are there particular women who should avoid using water during labour?**
- **to what extent immersion in water affects the length of labour?**

## Implications for maternity services

Water use during the first stage of labour is offered by the majority of maternity care provider units in the UK and most offer support for water birth<sup>8</sup>.

Introduction of, and sustained support for; water use may have considerable implications for service governance<sup>68</sup>. However, not all costs fall to providers of care; a substantial cost burden is likely to be borne by labouring women themselves during informal use in domestic baths and showers or by hiring specially designed pools for use in their home or in a maternity unit. Most maternity units have installed a water pool for use in labour<sup>8</sup> and although installation and maintenance of a specially designed pool in a maternity unit involves obvious financial cost, this may be offset if there is a reduction in analgesia and anaesthetic use<sup>44</sup>.

There is evidence that formal water use means that at least one midwife will be in constant attendance during the first stage of labour and that at least two will be in attendance for birth<sup>7</sup>.

This level of staffing may be difficult to sustain and may have implications for equity of care for women who do not use water<sup>22</sup>.

Clear strategies for the training, preparation and support of staff who offer use of water during labour are recognised as essential<sup>7,25,31,37,44</sup>. Key components of these include clarification of the roles of different maternity health professionals, multi-disciplinary development of local protocols, development of guidelines for clinical practice, and short-term secondment of midwives to learn alongside practitioners skilled and experienced in water use.

## Implications for practice

Women may choose to use immersion in water during labour and/or birth. Midwives and other maternity care workers should therefore be knowledgeable about the evidence in terms of potential advantages and disadvantages. Given the current quality of reliable evidence, effective practice is likely to be informed and influenced substantially by shared experience and personal observation. Disproportionate weight may therefore be placed on perceived disadvantages or advantages and credibility given to outcomes which may not be associated causally with water use. Practitioners should be alert to the evolving evidence base which underpins the use of water:

- **Immersion in water during childbirth is a care option women may wish to choose and which health professionals have a responsibility to discuss and support using clear and balanced information.**
- **As with any labour or birth, it is essential to maintain systematic, contemporaneous records and to monitor and record routine observations about the well-being of the mother and the fetus. These data should be used to audit care and gather information about outcomes.**
- **Water temperature should be measured regularly using a thermometer and recorded. The water temperature should be comfortable for the woman and should be not more than 37°C during the first stage of labour and between 36-37°C in the second stage.**
- **Maternal faeces, meconium and blood clots should be removed from the water using a sieve, and effective cleaning of pools before/after use should be carried out to minimise risk of infection or cross-infection.**
- **Birth in water: the baby should be born fully submerged and be brought gently and without delay to the surface so that he/she can make their first respiratory efforts in air.**
- **Comprehensive, large scale research is required to address questions about the safety and effectiveness of using water during labour and/or birth.**

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