

# Manual handling risks to midwives associated with birthing pools: literature review and incident analysis

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**This report describes research into the manual handling related risks to midwives associated with providing care to women choosing to use a birthing pool for labour and/or birth at home and in hospital.**

**The research comprised: a review of incidents reported to the Health and Safety Executive, a literature review and familiarisation visits to include discussions with midwives to identify current practices and procedures.**

**The manual handling risks are likely to result from the position of the mother in the pool, as well as from the position of the midwife whilst undertaking tasks at the birthing pool, and when actively supporting a mother's entry/exit into the pool or the mother using the midwife as a support whilst entering/exiting the pool. The risk of manual handling injury is exacerbated in the home birth setting, as, despite planning, there is typically less control over environmental factors.**

**The research suggests a need for the development of guidelines for good practice with regard to birthing pool, room and equipment design for both hospital and home birth settings. This is fundamental to reducing the manual handling risks to midwives and to enable the midwife to focus on the safety of the mother and baby.**

This report and the work it describes were funded by the Health and Safety Executive (HSE). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

# Manual handling risks to midwives associated with birthing pools: literature review and incident analysis

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## KEY MESSAGES

- The aim of this research was to detail the manual handling related risks to midwives providing care to women choosing to use a birthing pool for labour and/or birth at home and in hospital. HSE incidents for healthcare professionals were reviewed and the majority of incidents involving birthing pools (both at home and at hospital) were manual handling related. These manual handling risks to the midwife are likely to result from the position of the mother in the pool, the position of the midwife whilst undertaking tasks at the birthing pool, and when actively supporting a mother's entry / exit into the pool or the mother using the midwife as a support whilst entering / exiting the pool.
- Design features that may potentially improve the posture of a midwife include: appropriate pool side height to enable access to the mother; a seat / stool (e.g. saddle), platform, or steps for the midwife to sit on; a raised seat area inside the pool (integral or otherwise) to position the mother nearer to the midwife; pool sides indented or curved with an undercut to allow knee / feet room for the midwife and; long-handled equipment to reduce reaching, such as a mirror for monitoring and sponges for cleaning.
- Whilst on familiarisation visits, midwives commented that there is less manual handling involved for water births because there is less need to bend. Entry and exit of the mother into the pool are key activities where manual handling related injuries occur. Not all birthing pools are designed with steps and handrails; so consequently, suitable additional equipment such as grab handles and portable steps should be available to minimise the risk of the mother slipping and midwives feeling the need to physically assist. This equipment needs to be compatible with the birthing pool's design and room layout. Slip resistant flooring around the pool area in a hospital or home setting will also help to reduce any potential slips by the mother and the need for a mother to use the midwife as a support.
- Emergency evacuation procedures differ between maternity units and require using a net or a hoist. This research revealed that use of a net was generally preferred over the use of a hoist. This is because the net is considered a quicker (and cheaper) method of evacuating the mother from the pool although this method requires more manual handling and relies on more staff being available in an emergency.
- The risk to midwives of manual handling injury is exacerbated in the home setting, as, despite planning, there is typically less control over environmental factors. In addition, there may not necessarily be any emergency equipment to evacuate the mother from the pool, and there will be fewer people available to assist. Additionally, it may be less likely that equipment will be brought to the home to aid the midwife's posture or comfort, or to aid the mother in and out of the pool.
- This research suggests a need for development of guidelines for good practice in regard to pool / room / equipment design and specification for both hospital and home birth settings. This could include some detailed specifications for pool dimensions, handrail locations, step heights and sizes, etc. The design of a birthing pool and associated equipment is fundamental to reducing the manual handling risks to midwives and enabling the midwife to focus on the safety of the mother and baby. Additionally, emergency evacuation procedures using a net require attention, both in terms of manual handling safety, and patient safety.

# EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

A water birth is a method of giving birth, which involves the expectant mother's immersion in warm water. If labour progresses normally, it may be possible to deliver the baby in the pool. Some maternity units have birthing pools and it is possible to hire or buy a birthing pool so that the expectant mother can choose to have a home water birth.

HSE incident reports for healthcare professionals suggest that there are manual handling related risks to midwives assisting births in pools. Anecdotal evidence also suggests that some birthing pool environments are designed with aesthetics as the key feature with limited consideration of the health and safety of midwives.

Birthing pools vary in design in terms of side height, their shape, construction material, and in the provision of means of access and egress such as steps and handles/rails. These factors could all influence the risk of manual handling related problems for midwives. The manual handling injury risks to midwives tend to arise from the need to adopt awkward postures to accommodate caring for women labouring and giving birth in their chosen position and in response to external force being applied to the midwife by the mother. This situation could potentially involve higher risks in the home due to their generally being less control over hazards within the home environment. Although birthing pools are designed to be used for mothers assessed as low risk (where the mother and baby are not affected by conditions or circumstances that can complicate the birth), if either the mother's or the baby's condition deteriorates, emergency evacuation may be necessary. There are concerns around this activity as it is not well understood what manual handling is required, what/if equipment is available, or whether the appropriate person handling training is provided for midwives for these circumstances.

HSE has received many calls from manual handling advisers asking for advice on this subject. At present, there is a lack of guidance or information on the variability in birthing pool characteristics and use, and the consequent person handling related issues.

## 1.2 AIM OF RESEARCH

The aim of this research is to provide a report detailing the manual handling related risks to midwives associated with providing care to women choosing to use a birthing pool for labour and/or birth at home and in hospital. The research will specifically focus on the risks of injury to midwives related to manual handling and other healthcare workers associated with emergency evacuation from the birthing pool.

## 1.3 METHODOLOGY

A mixed-method research design was employed consisting of three parts:

- An HSE incident review of healthcare workers to gain an understanding of the nature and extent of the problems
- A literature review to gain an appreciation of the risk factors for midwives and identify any good practice procedures available

- Familiarisation visits to put the literature review into context and identify current practices and procedures in community (home) and hospital environments, and to identify any good practice procedures.

#### **1.4 SUMMARY OF FINDINGS**

The incident statistics in relation to birthing pools indicate that manual handling related injuries to midwives are the most common (both in a hospital and home environment). It was identified from the limited information provided in the incident description that a combination of the position of the mother in the birthing pool and the tasks undertaken by the midwife are contributors to midwives adopting poor postures. Additionally, the exit of a mother from a birthing pool may lead to the midwife actively supporting the mother's weight or the mother using the midwife as a support, which may lead to a manual handling related injury for the midwife.

Little research was identified in the literature review concerning the manual handling risks to midwives and birthing pools. The research in this area tended to focus on the pros and cons for the baby and mother rather than the midwife. This focus on the mother and baby also is the mind-set of the midwife and therefore any recommendations to reduce the risks to midwives should be tailored accordingly.

One of the main exclusion criteria reported for water births is a Body Mass Index (BMI) cut off which ranged from 35 – 40. However, a mother outside this low risk birth criterion, is still able to request and have a water birth, but would need to be made aware of the associated risks / risk assessment.

Typical tasks undertaken in a birthing pool are the same as those taken out of water however midwives commented that there is less manual handling involved for water births because there is less need to bend. Entry to or exit from the pool is a key activity where manual handling related injuries to midwives occur. Not all birthing pools are designed with steps and handrails, so consequently suitable additional equipment such as grab handles and portable steps, should be available to minimise the risk of the mother slipping and midwives feeling the need to physically assist. This equipment needs to be compatible with the birthing pool's design and room layout. Slip resistant flooring around the pool area in a hospital or home setting will also help to reduce any potential slips by the mother and the need for a mother to use the midwife as a support.

The use of a birthing pool means that measures need to be taken to ensure that the midwife can get as close as possible to the mother to reduce manual handling injuries. The following suggestions are ways that may potentially improve the posture of the midwife assisting in a water birth:

- Appropriate height of pool side relative to the mother and midwife
- Pool sides indented or curved with an undercut to allow knee / feet room for the midwife
- Use of steps, raised platform, seat, stool (e.g. saddle) or chair
- A raised or integral seat inside the pool to position the mother nearer to the midwife

- Equipment designed to be waterproof, lightweight and easily held. Suggestions include a long handled, single use sponge to clean the birthing pool and a long handled mirror to facilitate easier monitoring
- Underwater lighting.

The design of a birthing pool and associated equipment is fundamental to reducing the manual handling risks to midwives, as the mind-set of a midwife is to put the safety of the mother and baby before their own.

The two main methods reported for removing the mother from the pool in an emergency are a patient hoist (and sling) or a purpose designed lifting net. These methods are rarely used because most situations are clinically managed before it gets to an emergency evacuation state. This research revealed that the hoist method was least preferred by midwives as it was described as slow and cumbersome, it was felt not to fit into the aesthetics of the room and staff were not confident in its use due to being given limited (or zero) training. Additionally, if the hoist is electric and not stored correctly it will not charge. However, for maternity units with limited numbers of midwives, the hoist method is preferred as a minimum of 4 staff would be required for the net method. The net method was viewed as a much quicker (and cheaper) method of evacuating the mother from the pool although it requires considerably more manual handling than using a hoist and relies on more staff being available in an emergency. One incident reviewed in this research described an injury to a midwife that occurred as a result of a practice emergency evacuation using the net method.

This research has identified a potential lack of training for some midwives in the emergency evacuation procedures. The universities which offer midwifery courses provide an element of training in water births and it is considered likely by the Royal College of Midwives (RCM) that manual handling will be covered in this. However, there is no standard training module for consistency, as each NHS Trust provides its own training. Therefore, not all midwives may be trained in water births, but may learn by observing and aiding others, or by attending study days if provided by the individual Trusts.

The risk of manual handling injury to midwives is exacerbated for water births in the community (home) setting as, despite planning, there is typically less control over environmental factors. In addition, the design of the pool is fundamentally different, there may not necessarily be any emergency equipment to evacuate the mother from the pool and there will be fewer people available to assist. It also may be less likely that equipment will be brought to the home to aid the midwife's posture or comfort, or to aid the mother in and out of the pool, both generally and in an emergency.



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# 1. INTRODUCTION

A water birth is a method of giving birth, which involves the expectant mother's immersion in warm water. If labour progresses normally, it may be possible to deliver the baby in the pool. Some maternity units have birthing pools and it is also possible to hire or buy a birthing pool so that the expectant mother can choose to have a water birth at home.

HSE incident reports suggest that there are particular manual handling related risks to midwives assisting with births in pools. Anecdotal evidence also suggests that some birthing pool environments are designed with aesthetics as the key feature with limited consideration of health and safety of the midwife at the forefront.

Birthing pools appear to vary in design in terms of side height, their shape, construction material, and in the provision of means of access and egress such as steps and handles/rails. These factors could all influence the risk of manual handling related problems for midwives. The manual handling injury risks to midwives tend to arise from the need to adopt awkward postures to accommodate caring for women labouring and giving birth in their chosen position. This situation could potentially involve higher risks in the home due to less control of the home environment. Although birthing pools are designed to be used for mothers assessed as low risk (where the mother and baby are not affected by conditions or circumstances that can complicate the birth), if the mother's or baby's condition deteriorates, emergency evacuation may be necessary. There are concerns regarding this activity as it is not known what handling is required, what/if equipment is available, and whether the appropriate person handling training is provided.

HSE has reported receiving many calls from manual handling advisers asking for advice on this subject. At present, there is a lack of guidelines or information on the variability in birthing pool characteristics and use situations, and the consequent person handling issues.

HSEs' understanding of the risks associated with the tasks of a midwife providing care to women who choose to use a birthing pool (both at home and at hospital) needs expanding. This research aims to provide an appreciation of the tasks and the risks for midwives associated with person handling in routine activities and emergency evacuations from birthing pools.

## 1.1 AIM OF RESEARCH

The aim of this research is to provide a report identifying the manual handling related risks associated with a midwife's task of providing care to women who choose to use a birthing pool for labour and/or birth either at home or in hospital. The research will focus on the manual handling related injury risks and the risks to the midwife associated with emergency evacuation from the birthing pool.

## 2. IMPLICATIONS

- The future looks set to include guidance from the National Institute for Health and Care Excellence (NICE) to encourage low risk mothers to use midwifery-led units. Therefore, it is likely that there will be an increase in the use of birthing pools in these units and consequently more exposure for midwives to any potential manual handling risks associated with this activity.
- The design of a birthing pool and associated equipment is fundamental to reducing the manual handling risks to midwives, as the mind-set of a midwife is to put the safety of the mother and baby before their own.
- BMI acceptance criteria vary between hospitals, and mothers assessed as high risk are still able to choose a water birth. Therefore, potentially, there would be an increased likelihood of an emergency occurring for high-risk mothers and midwives may be supporting and handling patients with high BMIs increasing the risks of sustaining manual handling injuries.
- A review of the compatibility and suitability of the arrangement to enter / exit the pool is needed to minimise the risk of the mother slipping and midwives feeling the need to physically assist.
- This research revealed that choice of emergency evacuation procedure from a birthing pool was based partly on preference, perceptions and appearance. Generally, the net method of emergency evacuation was preferred. This method relies on more staff being available and more manual handling but was preferred as it was considered to be a quicker and cheaper method. If a hoist method is used for emergency evacuation there needs to be a system in place to check it has been charged and midwives require appropriate training in its use. Regardless of the method, the emergency procedure needs to be learnt, practiced and refreshed.
- The risk of manual handling injury is exacerbated in the home setting as there is less control over environmental factors. In an emergency, there may not necessarily be any equipment available to use to evacuate the mother from the pool and there may be fewer people available to assist. Additionally, it is unlikely that equipment will be brought to the home to improve the posture or comfort of the midwife and to aid the mother in and out of the pool both generally and in an emergency.
- Suggestions for further research are to assess the level of risk by examining postures for different tasks using methods such as the Manual Handling Assessment Chart (MAC) or Rapid Entire Upper Body Assessment (REBA).

## **3. METHODOLOGY**

### **3.1 RESEARCH DESIGN**

A mixed-method research design was employed consisting of three parts:

- An incident review to gain an understanding of the nature and extent of the problem
- A literature review to gain an appreciation of the risk factors and identify any good practice procedures available
- Familiarisation visits to put the literature review into context and identify current practices and procedures in the home and hospital environment and to identify any good practice procedures.

### **3.2 INCIDENT REVIEW**

We undertook a review of incident data involving birthing pools both at home and in the hospital with the objective of gathering evidence concerning the nature and extent of problems associated with water births. The focus of this review was manual handling incidents however, other risks that might be pertinent to further birthing pool work were also included.

The HSE Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) database was searched to identify incidents occurring between 2003 and 2013, using the search terms *water birth* and *birthing pool* in the incident descriptors. The search period spans a change in the RIDDOR reporting scheme so the output fields differed slightly for some of the records.

The HSE Corporate Operational Information System (COIN) database was searched for incidents that had previously been investigated or are undergoing investigation by HSE. Only one COIN report was retrieved in this search. Additional issues of concern (but not leading to incidents) reported on this topic were also reviewed.

The Medicines Healthcare Regulatory Agency (MHRA) was contacted as historically birthing pools were classified as medical devices. Although the MHRA could provide no incident information for this report, it confirmed that historically there have been very few incidents concerning birthing pools on their database and the few incidents reviewed were not associated with manual handling.

### **3.3 LITERATURE REVIEW**

We undertook a review of the literature to gain an appreciation of the topic area and to provide evidence of potential manual handling related injury risks associated with routine and emergency evacuation from birthing pools for both home and hospital births. Good practice procedures or recommendations identified from the literature were also noted.

#### **3.3.1 Key search terms**

A list of relevant search terms was generated and agreed with the customer. A request was then submitted to the Health and Safety Executive (HSE) Science Information Centre specifying the key words and phrases that were considered relevant to the topic area. Search terms were

identified as: birthing pools / water births / underwater birth / pool / home birthing pools / community birthing pools. The HSE's Science Information Centre searched against the following list in combination with each description identified above: manual handling; MSD; emergency evacuation; routine evacuation / procedures; RA; environment; MH; labour; delivery; design; risks; midwives; medical practitioners; MH equipment ;MH tools; maintenance; safe system of work; assistive technology; management; floors; planning; psychosocial; clinical protocols; posture; paramedics; home; hospital; home births; community; training; tasks; hoists; net;lift ;aid; sling; slide sheet; trolley; steps; access systems; chair hoist; incident; accident; still birth; policy.

### **3.3.2 Sources**

The HSE's Science Information Centre conducted a search of both academic and non-academic literature published worldwide over the past 10 years. Sources suggested to the search team included: previous HSE research; Medical and midwifery journals/magazines; Royal College of Midwives; Hospital Trusts; NHS information to the public; a general web based search; Ergonomics Abstracts; Care Quality Commission; Web of Science; OSHROM; MEDLINE; Science Direct; World Health Organisation; general midwifery council; equipment manufacturers.

### **3.3.3 Selection Criteria**

From scanning the titles and abstracts for information concerning the key topic areas above, the search yielded 50 potentially relevant references specific to the topic. On review of the 50 full articles, it was apparent that 10 articles were not relevant to the research topic. Fourteen of the articles were considered directly relevant; 13 contained only a small section of relevant information within the article; and the remaining 13 were more useful to setting the scene to this topic area.

Although the search was requested to cover articles published within the last 10 years, the following exceptions were made with the consent of the customer. Two relevant full articles were identified from Hignett (1996) who is well known for her research in the healthcare sector. Although dated, due to the lack of relevant full references specific to this topic area, these articles were included in the selection criteria. One other dated reference (Alderdice et al, 1995) was also included due to the two-line summary it provided of a relevant study in this field of research.

## **3.4 FAMILIARISATION VISITS**

We undertook visits to two Trusts to look at a midwifery-led unit and two maternity wards. These visits provided an opportunity to speak to midwives about their experiences of birthing pools, the environment, manual handling risks, tasks undertaken, equipment used, emergency evacuation procedures, training, policies and procedures. Photographs and some measurements of birthing pools were also taken during these visits. This information was used to verify and gain a fuller understanding of the issues identified in the literature and to identify current practices within the hospital and home environment which may or may not have been reflected in the literature. Additional information was also gathered via email contact from another Trust.

## 4. INCIDENT REVIEW

Appendix 1 details each incident reviewed from 2003 to 2013. Information for each incident is tabulated into the following categories: Occupation of Injured Person (IP); Age of IP; Incident Location; Severity of Injury; Cause of Injury; Nature of Injury; Body part injured; Description. A summary of potential key risk factors for each incident is provided. This is based on the limited information provided in the description and in the majority of cases the summary infers what factors are of potential relevance. The summary does not claim to provide a definitive answer (nor evidence to be used in any legal proceedings), and other contributory factors have not been analysed.

### 4.1 INCIDENT LOCATION AND NATURE OF INJURY

Table 1 summarises these incidents in terms of incident location and the nature of injury.

**Table 1** Summary of incidents

<i>Nature of Injury</i>	<i>Incident location</i>		<i>Total</i>
	<i>Home</i>	<i>Hospital</i>	
Manual Handling	4	30	<b>34</b>
Slips and Trips	1	5	<b>6</b>
Other	0	1	<b>1</b>
<b>Total</b>	<b>5</b>	<b>36</b>	<b>41</b>

The statistics reveal that 88% of all incidents reviewed occurred at hospital and 12% in the home setting. This is not surprising considering around 1 in 10 (NCT, 2010) births occur at home.

In a hospital setting, 83% of the injuries were attributed to *manually handling/supporting a person or injury through body movement whether or not a load is involved* (as described in RIDDOR), 14% to slips and trips and 3% to other.

In the home, manual handling accounted for 80% of the incidents and slips and trips was 20%.

Overall, 83% of all the incidents reviewed (both at home and at hospital) were attributed to manually handling, 15% to slips and trips and 2% to other.

### 4.2 MANUAL HANDLING RISK FACTORS

The focus of this research is the manual handling related injury risks from birthing pools. This incident data supports this focus, as the vast majority of incidents are manual handling related whether in the hospital environment or home.

Further analysis of the manual handling category was carried out to ascertain possible contributing risk factors. Table 2 suggests top-level scenarios that contributed to the manual handling incidents as identified in the description of each incident. The numbers do not reflect the number of incidents as for some incidents a combination of factors was suggested. This analysis has been undertaken with limited information, and in the majority of cases, the factors that are of potential relevance are inferred.

**Table 2** Risk scenarios for manual handling incidents

<i>Risk scenario</i>	<i>Total</i>
Supporting mother or the mother supporting themselves on the IP	7
Mother exiting the pool	4
Posture: leaning/bending/stretching into pool	19
Maintenance	1
	<b>31</b>

Just under a quarter of the manual handling injuries were attributed to actively supporting the mother or the mother using the midwife as a support. Reasoning from the incident description for a mother supporting themselves on the midwife or the midwife supporting the mother were found to be mainly the same: if the mother was distressed, felt faint, wanted support during labour (e.g. when pushing) or required assistance to exit the pool. Therefore, the category *mother exiting the pool* was often seen as the catalyst to this scenario. However, the most common risk scenario (61%) was recognised as the midwife needing to lean, bend, or stretch into the pool. Possible reasons for the poor postures identified were described as:

- Mother's position in the pool (for example due to unwillingness of the mother to move as they did not want to be disturbed)
- Tasks performed:
  - Fetal heart measurements
  - Bringing baby to surface
  - Untangling cord
  - Checking signs of baby's head
  - Applying pressure to unclamped cord
  - Shoulder dystocia (difficult birth)
  - Examining mother
  - Putting plug into pool
- Position of pool (unable to ascertain why from brief description)
- Pool design (low sides).

#### **4.3 SUMMARY OF INCIDENT DATA**

As expected, the majority of incidents occurred in a hospital setting rather than at a home with the statistics reflecting the expected percentage split between home and hospital births. Manual handling was identified as the principal reason for injury both at home and in hospital (around 85% of all incidents reviewed). Two primary factors were identified: poor posture (due to the nature of the tasks that the midwives were undertaking and the position of the mother in the birthing pool); and actively supporting a mothers weight or the mother using the midwife as a support, often as a result of the mother exiting the pool.

The literature review and familiarisation visits will seek to investigate these risk factors and others further.

## **5. LITERATURE REVIEW AND INSIGHT GAINED FROM FAMILIARISATION VISITS**

### **5.1 BACKGROUND TO WATER BIRTHS AND BIRTHING POOLS**

#### **5.1.1 Statistics**

Immersion in water during labour was popularised as a formal method of analgesia by Odent in the 1970s (Beake, 1999) and became widespread after the Winterton Report recommended that all maternity services provide women with the option to labour and/or deliver in water. A national survey of maternity units in the UK in 2002 found that 63% had a birthing pool and by 2007 95% of maternity services in the UK had a birthing pool (Burns, 2012). This figure is now likely to have increased.

Water is known to be beneficial as its buoyancy enables a mother to move more easily than on land and can optimise the progress of her labour. Additionally, the opportunity to labour in water is recommended in terms of for pain relief (NICE, 2007). This approach to care can be provided using a variety of pools and in both the home and hospital settings.

According to a published account of underwater birth practices in America (Veltman and Doherty, 2013) about 250 hospitals and 70% of all birth centres support water birth (delivering underwater).

The National Childbirth Trust (NCT) (2010) report that in 1994-96 about 1 in 200 women giving birth in England and Wales had a water birth. Nearly one in 10 of these were at home and over three quarters were in the south east of England. Many more women use water during part of their labour but exit the pool before delivery. Boulton (2011) an HSE Specialist Human Factors Inspector, visited a midwifery unit which caters for approximately 3,500-4,000 deliveries a year and comments that of the 400 pool births, 80% of women labour in the birthing pool but only about 35% actually give birth in the pool. Although there are several recent studies and audits on water births, the MIDIRS reference database finds that there is no recent UK national data. The Royal College of Gynaecologists (RCOG) /Royal College of Midwives (RCM) recommended in 2006 that water immersion in labour should be audited so it is assumed that individual units therefore keep their own records. A survey of over 23,000 women published by the Care Quality Commission in December 2013 states that 34% of women used water in labour.

The NCT (2010) comment that there is a difference between units on how often birthing pools are used. A number of reasons are suggested for this difference including the attitude of midwives in the unit, the strictness of the criteria guidelines for the screening of mothers and the number of midwives who are trained to attend women in water. They comment that the more times a birthing pool is used, the more experienced and confident the midwives will be.

#### **5.1.2 Criteria for a water birth**

RCM guidelines and the RCOG state that the criterion for a water birth is for those with a healthy uncomplicated pregnancy. This appears to be the consensus across the UK literature and Mc Cormick (2011) adds that women should be physically able to get in and out of the pool. However a review by Chapman (2004) of five New Zealand hospital protocols commented that there were marked inconsistencies between the exclusion criteria for the use of a birthing pool in labour.



### 5.1.3 Birthing pool design

There are a number of companies that supply birthing pools to hospitals and for private home use. There are different sizes of pool to suit the size of the mother. Hale (2008) and Brown and Rogers (2008), for example, identify inflatable “regular” pools (193 x 165 cm) for women up to 182 cm in height and “mini” pools (165 x 145 cm) for women up to 172 cm in height. The width of the rim is 25 cm. These pools have an internal depth of 66 cm although can only be filled to a depth of 56 cm.

The RCM (1999) suggests that greater awareness of the importance of ergonomics has led to improvements in the design of birthing pools. However, research in the Netherlands of 31 midwives in 2006-7 (De jonge et al, 2008) found that many of the midwives surveyed commented that birthing pools could be *more midwife friendly*. Australia’s largest range of birth pools, Aquaborn, states that their birthing pools are ergonomically designed “*so that a midwife is able to more easily assess a mother in the water without putting themselves at risk of back and shoulder injury...At no time should the midwife need to bend or twist through 90 degrees*”(Aquaborn, webpage accessed 14.04.14). Ideally, midwives should be able to get as close as possible to the mother so minimising the extent to which they would have to bend to reach over the pool side. Although in many cases the use of water in labour and birth facilitates a hands off approach, it is essential to have easy and quick access to a mother when she is in the pool should an emergency arise. Additionally, Aquaborn birth pools state that *with the midwife kneeling at one side of the pool and the mother directly opposite, the midwife can reach a mother of average height by allowing only 25 degrees flexion at the hips whilst keeping the back straight and maintain a 30 degree bend in the elbow for optimal handling* (Aquaborn, webpage accessed 14.04.14).

Birthing pool design features which may benefit midwives as suggested in the literature (e.g Aquaborn birth pools webpage, RCM (1999), Boulton (2011), Brown and Rogers (2008) and Hignett (1996)) consist of:

- Increased pool height to support a midwives trunk. Pools with lower sides traditionally facilitate unwanted lumbar spine flexion in order to reach further forwards to the mother in the water
- Grab handles to aid support to the mother when getting in and out of the pool. Aquaborn eco birth pools identify that “*the handles are placed where the client has to use the pool width ways during active birth. This positions the client directly in front of the midwife at the shortest distance away which eliminates twisting and excessive forward reaching*”
- Concave sides to provide knee room and reduce the distance between the midwife and the mother
- A raised platform or absence of surround to enable the midwife to get closer to the pool
- Raised / integral seat inside the pool (will help to facilitate delivery and examination of the perineum and to make it easier to move the mother in case of difficulty)
- Pools with the ability to rapidly lower water levels in an emergency.

A general internet search revealed a number of different designs, illustrated below, which include the inclusion of integrated or additional steps for easier access (although one set looks very small and may not extend high enough to be of much assistance); curved, indented walls of

the birthing pool to allow the midwife to get closer to the mother; grab handles to aid the mother; and integrated or additional seats.



X6J-1196921 [RM] © www.visualphotos.com

**Photograph 1** Example of additional steps



**Photograph 2** Example of a shaped, indented side pool ([www.flickr.com](http://www.flickr.com))



**Photograph 3** Example of integrated steps and grab handles ([www.tru-tech.co.nz/images/Birth\\_pool.jpg](http://www.tru-tech.co.nz/images/Birth_pool.jpg))



**Photograph 4** Example of additional seat and grab handles ([www.pregnancy.com.au](http://www.pregnancy.com.au))

#### 5.1.4 Insight gained from familiarisation visits

##### 5.1.4.1 *Medical professionals involved in water births*

From the familiarisation visits, it was established that normally other medical professionals are not involved in a birth using a birthing pool; rather it is one midwife during labour and two during delivery.

#### **5.1.4.2 Usage of birthing pools**

Usage of a birthing pool in a maternity ward can be unpredictable and in a large unit (e.g. 90 staff) the number of water births per midwife may only be at around three per year. In a unit of this size, water births would account for around 200 plus deliveries a year with an estimated additional 50/60 labours in the pool and therefore is potentially not a significant manual handling risk. However, working in a midwifery led unit where mothers are assessed as low risk and therefore are all eligible to use a birthing pool (unlike a maternity ward) the percentage of water births would be much higher. In their draft guidance the National Institute for Health and Care Excellence (NICE) state that “*Healthy women experiencing a straightforward pregnancy should be encouraged to give birth in a midwife-led unit rather than a traditional labour ward*” (Nursing Times, 2014). The RCOG have said that it supported the recommendations, as long as issues around emergency back-up options and the assessment of pregnancy risk were ironed out (BBC News, 2014). Inferences made from this would be that birthing pools (a birth option for low risk mothers) may be used more widely in the future and therefore midwives may become more exposed to the manual handling and postural risks than at present.

#### **5.1.4.3 Criteria for water births**

The criteria for water births at the units visited was consistent with the criteria established from the literature review in that they are considered suitable for uneventful pregnancies where the mother is fit and healthy with no underlying problems. This was said to cover around 20% of women with around half of these women actually using the birthing pool (limits in numbers may be due to lack of pool availability).

Reasons given for why a mother is assessed as high risk and therefore is not advised to use a birthing pool would be: retained placenta; breech; small for gestational stage; previous C-section; blood pressure problems and haemorrhage. A gap of around 3 – 4 hours is required after a mother has had diamorphine before she is able to enter the pool in order to ensure she is not under the influence of the drug. One of the main exclusion criteria stated for a water birth is the BMI cut off limit which varied between units and ranged from 35 (36 in exceptional circumstances if the mother is fit) to 40. A comment was made that the “low risk” criteria may be expanding its parameters.

A mother who is assessed as high risk (under the exclusion criteria) may still choose a water birth and the midwives must respect this choice as long as the mother is fully aware of the risks and a risk assessment has been completed.

Differences in exclusion criteria between the units visited were found for situations where a baby needs to be constantly monitored. Some units have waterproof telemetry equipment (a form of electronic fetal monitoring without wires) whereas others did not which would potentially exclude the mother from a water birth in that unit.

#### **5.1.4.4 Design**

During the familiarisation visits it was commented that the pool appears to be “*designed for the mother*” rather than the midwife.

The birthing pools at the units visited were measured and the dimensions ranged from 74 – 78 cm high, 118 – 132 cm wide and 185 – 194 cm long. Design features present in the pools observed included underwater lighting and a shaped exterior. It was noted that some birthing pools are designed to be emptied by releasing a plug whilst others were operated by a lever.

Two designs were observed; an oval and a shaped pool (see Photographs 5 and 6).



**Photograph 5** Oval birthing pool



**Photograph 6** Shaped sides to birthing pool

Some midwives interviewed at the units visited expressed the opinion that birthing pools without additional accessories such as handles to aid mothers in and out of the pool and seats, were of poor design.

Suggestions of possible design features considered potentially useful / beneficial were:

- Height adjustable birthing pools to accommodate midwives of different statures
- A sunk in birthing pool that can be lowered (and raised) to allow the mother to enter and exit the pool more easily
- Mirrored pool surface (to reduce the need for the torch and mirrors method)
- Shaped / indented pools to allow the midwife to sit closer to the birthing pool.

## **5.2 BACKGROUND TO MANUAL HANDLING**

### **5.2.1 Manual handling and midwives**

The definition of manual handling in the Manual Handling Operations Regulations 1992 (as amended) (MHOR) (reference) includes transporting or supporting a load in a static posture. The MHOR also include moving and steadying or positioning a load as manual handling. In the case of maternity services the “load” being handled can include the mother (or part of her body) and the baby.

Manual handling and low back pain are well documented in nursing but tend not to have been researched in midwifery. Boulton (2011) comments that midwifery practice does involve bending, lifting and holding the body in fixed positions for periods of time and this means that midwives are at risk of musculoskeletal injury arising from through carrying out many of their normal routine tasks.

In a 2002 UK based study, MSDs were cited as a reason for midwives leaving practice but the proportion of midwives who left for this reason was unclear (Bali et al 2002). Dimond (1994)

suggested that 25% of midwives had taken time off from work due to back problems. The RCM (1999) reported 6000 midwives injure their backs each year and 300 of them give up their careers as a result. However, it is acknowledged that at the time this report was published access to employer provided training was fairly limited but that since then this has become part of mandatory training for staff (RCM 2013).

Although there is little information regarding how many midwives are affected by injuries associated with manual handling, it has been demonstrated that injuries can be caused by poor lifting technique, moving bariatric mothers and poor posture during delivery (Johnson and Taylor 2011).

### **5.2.2 Manual handling and birthing pools**

Although a large amount of research has focused on examining the risks and benefits of water births compared with other delivery options for women and babies, less research has focused on the midwives and their experience and perceptions of water births.

An annual audit at Nottingham City Hospital (Hignett, 1995) found that manual handling was the largest category of reported incidents for the maternity unit. As part of the risk assessment process the midwives identified two particular areas of concern with respect to musculoskeletal injury. One of these areas of concern was the working postures during delivery, in particular with the birthing pool. Alderdice (1995) identified that back problems may be experienced by midwives while providing care to women in labour in water.

### **5.2.3 Insight gained from familiarisation visits**

The couple of midwives asked were not aware of any manual handling problems with birthing pools; rather they cited other issues for example breast feeding or moving beds.

## **5.3 MIDWIVES' TASKS**

The literature suggests that clinical observations are undertaken as usual for land as in water. The following are typical tasks carried out by a midwife during labour and shortly after birth. Postures associated with these tasks are described in Section 5.5.2.

### **5.3.1 Vaginal examinations**

Vaginal examinations to determine the progress of labour is usual practice. An examination of five New Zealand hospital water birth protocols (Chapman, 2004) revealed that two hospitals mentioned that this observation could be undertaken in a birthing pool. Practices reported by midwives when assisting women who labour or give birth in water in a study between 1993 – 4 revealed that 38% of units stated that women were asked to leave the pool for a vaginal examination, 8% asked mother to stand or kneel out of the water and 26% carried it out under the water (Marchant et al 1996). It is acknowledged that in some cases, carrying out a vaginal examination in the water may be difficult for the midwives “due to the woman possibly being less accessible than if she were out of the water” (Chapman, 2004).

### **5.3.2 Fetal heart rate**

According to the NICE guidelines (NICE 2001) monitoring of the fetal heart should be standard practice using an underwater Doppler every 15 minutes for 60 seconds during the first stage of labour and after every contraction or five minutes during the second stage.

In the study by Marchant et al (1996), only one unit stated that women were asked to leave the water for this form of fetal heart rate monitoring. However, the NICE guidelines were published in 2001, which may mean that this unit has changed its protocol as this study was conducted before these guidelines and therefore all midwives will be monitoring fetal heart rate in a birthing pool.

### **5.3.3 Water temperature**

A national study conducted between 1993 – 4 of midwife practices (Marchant et al 1996) revealed that 13% of units took water temperature measurements flexibly or infrequently, the rest specified time intervals which ranged from hourly to a constant display on a temperature gauge.

### **5.3.4 Observations**

Many midwives use a non-touch technique which is preferred by women. However, abdominal palpitation to determining the strength, frequency and duration of contractions could be made by placing a hand on the abdomen.

Observations in the third stage of labour include the mother's general physical condition and vaginal blood loss. Observation of the perineum during water birth may be facilitated using torch and mirrors (McCloyhry, 2000) where the mirrors can be left in pool between observations and a torch shone on them as required.

### **5.3.5 Maternal temperature**

Maternal temperature should be monitored and documented hourly while the mother is in the birthing pool (Mc Cormick, 2011) although one New Zealand's hospital protocol (Chapman, 2004) advises maternal temperature checks occur at a two hourly rate.

### **5.3.6 Episiotomy**

One hospital's protocol in New Zealand (Chapman 2004) suggests an episiotomy can be performed while the mother is in the water if necessary. This however is contradictory to other evidence in the literature for example Garland (2000).

### **5.3.7 Insight gained from familiarisation visits**

The familiarisation visits consolidated the literature review findings that typical tasks undertaken in the water are the same as those taken on land including taking the temperature and blood pressure of the mother and listening to fetal heart rate. The use of underwater telemetry (if available) allows continuous monitoring of fetal heart rate if this is required. The midwives interviewed mentioned the torch and mirrors technique for observations of the perineum, however it was commented that mirrors were not left at the bottom of the pool as they tended to float back up. Monitoring water temperature (hourly or continuously via a thermometer) is an additional task. The information gained from the visits suggests that, in practice, vaginal examinations would typically be conducted out of the pool as would an episiotomy contrary to some sources in the literature. It was mentioned by one midwife that a baby would not be handled, rather guided gently to the mother. If there were any concerns, the cord could be clamped and cut in the pool.

#### 5.4 GENERAL EQUIPMENT USED IN ASSOCIATION WITH BIRTHING POOLS

*“Local policies should specify essential and desirable equipment for the use of water and make clear who is responsible for supplying it. All unit equipment should conform to British Standards and be checked by the health and safety officer” (RCM 1998).*

A review of five New Zealand hospital protocols (Chapman 2004) revealed that one protocol did not suggest any equipment requirements although the others did. Equipment suggested in the literature (Mc Cloghry, 2003, Chapman 2004, Veltman, and Doherty, 2013) consists of:

- Water thermometer
- Maternal thermometer
- Aqua (waterproof) Doppler / sonic aid to monitor fetal heart rate.



**Photograph 7** Aqua doppler

- Torch and mirrors
- Cord clamp
- Flotation aids
- Kneeling pads or cushion / mat to allow the midwife to kneel at the side of the pool to conduct examinations or offer support
- Ball or steps or stool (adjustable height) for the midwife to sit on to conduct examinations and offer support
- The provision of steps or grab rails to make it easier for the mother to get in and out of the pool by herself.

For equipment to be effective as a risk control measure it must be acceptable to midwives and be readily available at the point of use. Involvement of midwives in the specification, trials and selection process of equipment will help to ensure that suitable equipment is procured and used.

### 5.4.1 Insight gained from familiarisation visits

The familiarisation visits identified that midwives use a variety of equipment to position themselves next to the pool in order to monitor the mothers including stools, balls, chairs and steps (see photographs 8 - 16). As well as an underwater Doppler, underwater telemetry was also identified as a method to monitor fetal heart rate continuously although not all units have this equipment. Steps and handrails to facilitate the mother getting in / out of the pool were mentioned as equipment they used during water births and “seats” in the pool in order to raise the mother up from the bottom of the pool.

Equipment that was recommended by ergonomists interviewed included saddle stools such as the HAG CAPISCO stools. It was considered that these allow greater freedom of movement, variation and natural sitting positions so that the midwife may lean forwards with support. Other recommendations were access/egress steps which could be easily moved.



**Photograph 8** Example steps to assist the mother into and out of the pool (this design will facilitate close access to the pool)



**Photograph 9** Example of a support seat to raise the mother in the pool



**Photograph 10** Example of a platform to aid the mother into/out of the pool and for the midwife to kneel on



**Photograph 11** Thermometer for continuous monitoring of water temperature





**Photograph 12** Example mirror used to help examine mothers



**Photograph 13** Fold down grab handles to aid mother in and out of the pool



**Photograph 14** Steps built around the birthing pool to aid mother into the pool and access to the mother for the midwife



**Photograph 15** Ball for midwife to sit on, steps to aid mother into the pool



**Photograph 16** Floatation device to help the mother

## 5.5 MANUAL HANDLING RISKS

### 5.5.1 Mind set and the associated position of the mother

Research in the Netherlands (De Jonge et al 2008) revealed that in birth settings where women are encouraged to move about freely, the midwife is expected to conform to the labouring mother's chosen position(s). The literature also reveals that not all midwives will ask a mother to move themselves into positions which would ease the burden on a midwife. In essence, they choose to put themselves second.

This concept is highlighted in Hignett's review where overwhelmingly the concept of "mother first" was expressed in a variety of different ways. For example "*one midwife felt that she would probably get into the birthing pool (regardless of her own safety) if she perceived the mother and baby to be at risk*" (Hignett, 1996).

An NHS guideline (Hammersely 2011) demonstrates the mentality of midwives in thinking of the mother before themselves. It states that observations are to be carried out "*ensuring that the woman is disturbed as little as possible*". This would be the concept in any care setting.

Midwives are under pressure to give women the type of birth that they want (responding to their needs and demands). Participants in the research study by De Jonge et al (2008) said that they were prepared to sacrifice their own comfort to a great extent if a mother expressed a strong desire to use a certain position. It revealed that some midwives did not want to tell women that they had difficulty assisting them in certain positions e.g. because they themselves were pregnant.

De Jonge et al (2008) cites another study (Coppen 2005c) where midwives were asked if they were willing to assist a mother in a position that is uncomfortable for them. The study found that only 5% of midwives said that they would not, 58% possibly and 37% would definitely do so. This is consistent with the notion that most midwives put the mother first so that they can give birth in the position of their choice even if it was inconvenient for them.

In a study by Meyer et al (2010), midwives were asked to rate their concern regarding their experiences during a water birth. The findings indicated that midwives were most concerned about the maintenance of water temperature (mean score of 2.5 on a scale of one (no worry) to five (severe worry)), physical stress on the midwife (mean score of 2.4) and difficulty seeing the vagina (mean score of 2.4).

This mind set and physical stress is highlighted in Hignett (1996) who quotes from a review of published work about water births "*..but in a sense we don't have a choice, we can say no I won't do it but it's not really accepted. And..the UKCC (United Kingdom Central Council for Nursing, Midwifery and Health Visiting) have almost said that we have to ...if a woman wants it, we have to do it, regardless of ...how we might feel about it and what the position might do to us*". It was also revealed in the review by Stubbs and Buckle (1984) that it is unclear to what extent the health needs of midwives are considered in contrast to the more overt needs of the mother. There is a resultant conflict between the nurturing environment where the mother is the more important user of the environment than the occupational health and safety of the midwife. Little has been written about the influence of a midwife's working condition on the use of birthing positions although this emerged as an important factor in a study by Walsh 2000 and Coppen 2005c cited by De Jonge et al, 2008. If working conditions are mentioned, they are not considered a valid reason for influencing women's positions.

Evidence from the Netherlands study (2008) found that water births were mentioned most frequently as an option some midwives would not offer. The reasoning behind this correlates to the previous points of physical stress, for example on midwife in the study states “...*Actually I do not have many good experiences with water births. I have experience with a few in Great Britain and...I really do not like it at all...you cannot get to it very well...*”

The RCM (2014) acknowledge that staffing shortages often mean that midwives will work a 12 hour shift or longer and may not take any breaks as they are concerned about continuity of care. This again shows the mind-set of a midwife and how they think about the mother before themselves.

Consequently, it would appear that the position chosen by the mother for delivery mainly determines the working posture of the midwife.

### **5.5.1.1 Insight gained from the familiarisation visits**

Insight from the midwives revealed that they would ask the mother to move positions if needed as they are often encouraging a mother to move. However, it was felt that this is not something that can be “dictated” as part of the role of a midwife is to build up trust and to make sure the mother feels reassured.

The mind-set of a midwife is that she is looking after the mother and it is about the position that she chooses that is important and mothers are likely to change their posture frequently. If a midwife cannot reach, she may ask the mother to move but this was not considered an issue. To a certain extent, midwives do think about their posture but they are not in a particular posture for long periods.

### **5.5.2 Posture**

Findings from the literature regarding posture have been categorised into three broad categories of tasks that midwives undertake whilst attending water births (Brown and Rogers (2008), Hammersley (2011) and Lines (1993) cited in Hignett (1996)):

- **Observations / Measurements** e.g. vaginal examinations and to monitor fetal heart rate.

As discussed in the previous section, monitoring fetal heart rate necessitates the midwife potentially stretching into an awkward position whilst holding the probe in position on the mother’s abdomen. This is carried out at a repetition rate of once every 15 minutes and the static posture is held for a minute at a time. The use of sonic equipment may involve the application of pressure combined with an awkward grip and deviation of the wrist and/or awkward whole body postures involving bending, reaching and twisting over the side of the pool and kneeling / squatting on the floor. These awkward postures can be exacerbated if the mother is sat on the bottom of the pool (i.e. not raised seat within the pool) and will also be dependent upon the height of the pool sides. One NHS hospital’s guideline for the use of water in labour (referenced in Hammersley, 2011) states that “...*when caring for a woman in the pool at home the midwife needs to kneel at the side of the pool in order to support her back in accordance with Health and Safety regulations*”. Boulton (2011) states that whilst the midwife is monitoring the mother she would usually sit on a ball or a stool beside the pool so that she is in a comfortable position in which to offer support and guidance to the mother. If these aids are available and are used, the midwife should be able to maintain her back in a less flexed position.

- **Supporting / assisting a mother** e.g.
  - Supporting a mother's head above water if she is unable to do it herself
  - Supporting a mother in her delivery position
  - Assisting a mother stepping into and out of a pool.

The RCOG (2001) comments that the mother should always be adequately supported to ensure she does not slip. However the RCM (1999) advises to “*avoid supporting the woman directly*”. It is acknowledged on the Aquaborn website, accessed 14.04.14, that during a water birth, a “*midwife is most at risk of sustaining an injury if they are helping a mother in and out of the pool*”. Slade (1998) states that “*although a midwife provides psychological/emotional and practical support, they should not provide physical support which goes against agreed manual handling techniques*”.

- **Delivering a baby**

A task likely to involve the adoption of an awkward posture is retrieving the baby from the birthing pool although this would only happen once for each delivery as twins would not be born in a birthing pool. It is likely that the midwife will be bent over with her arms outstretched away from her body. One NHS guideline documents that “*the only time a midwife may have to bend over the pool is as the shoulders are delivering in order to assist the baby to the surface of the water*”. There is also likely to be a poor grip on the wet baby whilst handling at an awkward posture.

A combination of the above postures, sudden unpredictable movements from the mother and team handling in an emergency are also other likely scenarios for a higher risk posture.

The key therefore is to minimise the amount of time spent bending, twisting and stooping thereby lessening the strain on the back. A recommendation from Walsh (2007) is that midwives can learn to let women give birth in various positions while looking after their own backs at the same time, as some positions may be too awkward for midwives at times. Amos (2005) also recommends that midwives avoid bending or twisting at the waist to protect their backs by asking them to consider their own wellbeing when discussing birth plans with their mothers. Rather than having to manipulate women into other positions, they can be discussed with women during their pregnancy. Asking women to move their position is a good risk control measure but may not always be implemented considering the mind-set of a midwife is that the mother comes first as evidenced in the literature.

#### **5.5.2.1 Insight gained from familiarisation visits**

Maximum time in the birthing pool was estimated to be around 4 – 6 hours so within this period of time a midwife is likely to adopt a number of postures although they were not thought to be hindered by a mother's choice of position in a birthing pool. In fact, it was commented that the buoyancy of the water can aid the midwife to listen to fetal heart rate as the mother's abdomen can be raised up more easily so a mother sat on the bottom of the pool would not pose a problem. It was thought that there is more room for the midwife around the pool than if a mother is on land on all fours or on a birthing stool and there were options to vary posture either by sitting on steps, stools, on a ball, on the side of the pool, kneeling, standing or moving around. The ball proved a popular choice for midwives to sit on whilst monitoring as they felt they could get closer to the pool.

However, it was acknowledged that the high sides of a birthing pool might make it more difficult to reach the mother especially if a midwife has short arms, for example. Observations of some of the birthing pool designs do not facilitate the midwife to stand/sit close to the mother as there is no recess for the midwives feet / knees. It was also mentioned that a midwife might stand to observe the mother, which can result in poor neck posture due to looking down and may cause some discomfort.

The midwives interviewed felt that they do think about their posture as they can be better positioned if they consider which hand they will use and consequently the side of the pool they would stand / sit at to facilitate monitoring.

Photographs 17 – 22 demonstrate postures that may be adopted when monitoring at a birthing pool.



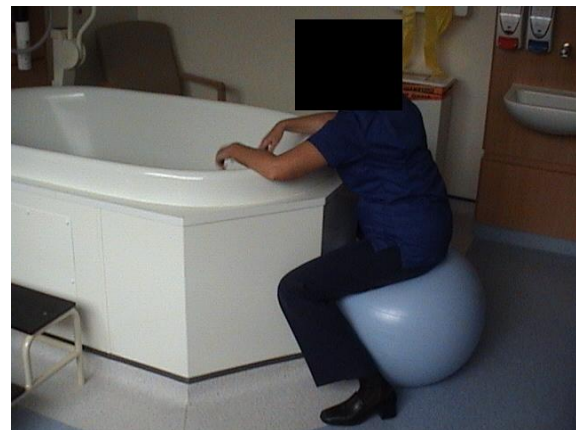
**Photograph 17** Example of using steps to reach a mother



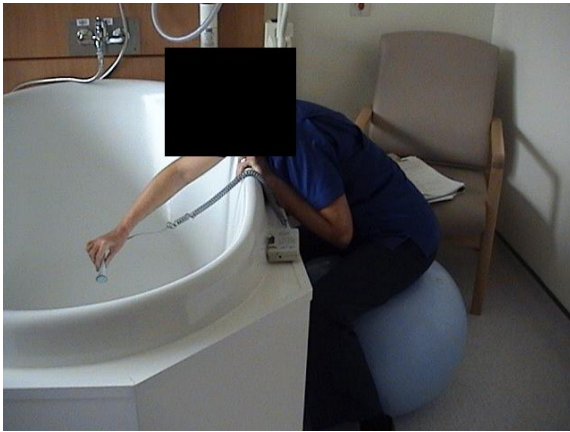
**Photograph 18** Example of using the side of a birthing pool to monitor a mother



**Photograph 19** Example of using steps to reach a mother (standing posture)



**Photograph 20** Example of using a ball to monitor a mother



**Photograph 21** Example of using a ball to monitor a mother



**Photograph 22** Example of kneeling to monitor a mother

Midwives commented that there is less manual handling involved for a water birth than on land as there is no need to bend over unless monitoring and this bending is not sustained. The consensus is that the main manual handling issues occur when the mother gets in and out of the pool and this could happen a number of times during a delivery as they are encouraged to go to the toilet regularly. Where the environment and birthing pool room set up allows, midwives can bring a bed over to the birthing pool thus reducing the distance a mother may have to walk whilst supporting herself on a midwife or with the midwife actively supporting the mother by holding onto her arms. Mothers are encouraged to use steps and handrails (if available) rather than holding onto the midwife as support. A recommendation to reduce this need to support the mother was to install a pole from floor to ceiling that the mother can use or for a handrail to be installed next to / into the pool. Other recommendations included using a long handled mirror during observations and a long handled single use sponge to clean the pool after the delivery, which will help to reduce trunk bending, and forward reaching postures for the midwife.

### 5.5.3 Environment

An examination of five New Zealand hospital water birth protocols (Chapman 2004) revealed that only one recommended that easy access is maintained around the pool. A review of published work by Hignett (1996) discovered that *“the midwives expressed the notion of being a visitor both in the client’s home and low dependency unit which could limit their ability to rearrange a workspace to facilitate the delivery of care”*. Obstacles and clutter are a risk factor to consider, for example, equipment and people in the room. Aquaborn, Australia’s largest manufacturer of a range of birth pools, provides guidance on their website, accessed 14.04.14, that *“pools should be set up in a space which allows a 70cm cleared perimeter around the footprint of the pool”*.

The presence of water, steam and moisture makes birthing pool rooms potentially hazardous areas to work in as it is likely that the floor will become wet in normal use. Recommendations in the literature (RCM, 1999) suggest:

- Non slip bathmats
- Slip resistant surfacing
- Floor surface modifications or replacements

- Spillages should be wiped and dried as quickly as possible
- Non-slip footwear.

### 5.5.3.1 *Insight gained from familiarisation visits*

The midwives interviewed recognised that the environment is made to look aesthetically pleasing. Whilst the midwives acknowledged that slips could happen, they did not consider that birthing pool rooms were more of a risk than anywhere else. Some of the birthing pool rooms observed had slip resistant floors (Photograph 23) yet others did not. A risk reduction measure for reducing slips included sheets or towels on the floor. Lighting was not considered a problem.



**Photograph 23** Non slip flooring around a birthing pool

### 5.5.4 **Individual factors**

The attributes and capabilities of the midwife is a factor that can affect performance and increase the risks from manual handling. Issues to consider that were highlighted in Brown and Rogers (2008) include:

- Fitness/health (pre-existing injury or illness)
- Pregnancy (a risk assessment must be undertaken)  
De Jonge et al (2008) states that *“midwives with back pain or who are pregnant will be more reluctant to assist a birth on a birthing stool or in a pool”*
- Lack of training / experience / confidence with home and water births
- Physical build, height, reach etc.  
Boulton (2011) states that *“the taller the midwife the greater the risk as she has to bend further to maintain her position whilst carrying out tasks during labour”*. The UKCC (1995) state that with respect to water births, if necessary the midwife should *“acknowledge own limitations and decline duties”* which may refer both to personal physical ability as well as experience.
- Fatigue (this could be due to a lack of work planning)
- Lack of food and drink (this could be due to a lack of planning).

#### **5.5.4.1 *Insight gained from familiarisation visits***

The midwives interviewed commented that size / stature were also issues that were considered to cause difficulty for a midwife. For example, a midwife of small stature may have found it difficult to reach to the bottom of the pool. As the literature stated, they also acknowledged that pregnant midwives would find this task difficult. In regards to injury, it was commented that midwives with knee problems would find it difficult to kneel at the birthing pool.

#### **5.5.5 *Mother (load)***

Consideration needs to be given to a mother's size and weight in circumstances where she may need to be lifted out of the pool. NICE (2010) states that there are rising numbers of bariatric mothers in the UK with one in every 1000 women who gives birth being extremely obese. Studies discussing how midwives should deal with bariatric women are scarce but one report (Cowley and Leggett 2010) investigating how clinical midwives are trained to deal with bariatric mothers concluded that knowing how to use specialised equipment is essential as is the ability of health professionals to assess and reduce risk in a range of environments. Mandelstam (2002) states that policies should be in place for dealing with this issue which consider the safety of midwives whilst ensuring dignity for the mother.

##### **5.5.5.1 *Insight gained from familiarisation visits***

As discussed previously, BMI is part of the risk criteria although it was stated that this is more of a concern for delivery on a bed rather than in a pool.

#### **5.5.6 *Other factors***

Boulton (2011) highlights psychosocial factors (such as degree of control over the work, high levels of attention and concentration and excessive work demands) as risk factors. Stressful situations will occur in midwifery, for example, the reaction and distress of families in an emergency, complications with labour e.g. haemorrhage and a distressed baby (Brown and Rogers, 2008). Midwifery has been described as emotionally exhausting, requiring lots of sustained input (Boulton 2011).

Brown and Rogers (2008) discusses that a midwife's clothing may limit postures if clothing is too tight.

Boulton (2011) revealed that some midwives perceived that they were put under pressure from management to accept health and safety responsibilities that they did not have the competence or confidence deal with. Consequently, this gave rise to a dilemma between care for mothers and health and safety.

### **5.6 *EMERGENCY EVACUATION***

Normally women who use birthing pools have been assessed as low risk yet, despite this, complications can develop and in these circumstances, it is usually necessary for the mother to leave the birthing pool as it may be impossible to manage the situation in the water. Shoulder dystocia is one such emergency and Baxley and Gobbo (2004) quotes the overall incidence of shoulder dystocia to vary based on fetal weight. It occurs in around 0.6 to 1.4 percent of those with a birth weight of 2.495 - 3.943 kg increasing to a rate of 5 to 9 percent for a birth weight of 4.479 kg born to mothers without diabetes.



Consequently, appropriate procedures should be developed for dealing with emergency evacuation situations.

The Cochrane collaboration review (Cluett et al 2009) assessed evidence from randomised controlled trials about the effects of immersion in water during pregnancy, labour or birth and highlighted that difficulties with emergency interventions can lead to delays for example if it is difficult to get the mother out of the pool or if the water does not flow out quickly.

The RCOG and RCM joint statement number 1 (valid until 2009) states that local guidelines should detail what steps are expected in an emergency. All midwives must be familiar with the procedure and should practice it regularly in emergency drills.

The RCM (1999) states that the emergency procedure plan must be based on a properly conducted risk assessment and include the following elements:

- Thorough consideration of all conceivable emergency situations that might arise
- A checklist of equipment to be used in an emergency such as mobile seat hoists or netting
- The equipment should be stored in locations known to all staff working in the birthing area. This point is also highlighted in Veltman & Doherty (2013) who states that emergency equipment must be available and ready for use inside or just outside of the room
- The equipment should be regularly tested and properly maintained
- Clear procedures including a step by step guide, for each emergency situation
- The number of helpers required and their respective roles should be identified. Brown and Rogers (2008) and Pidgeon (2010) also comment about planning the number of people required to lift the mother out of the pool and clarification of the midwives role. Pertinent to the number of helpers is the consideration of a mother's BMI as identified in an NHS guideline (McCormick 2011)
- Appropriate emergency training for all staff working in the birthing area. The importance of awareness and hands on training so that the midwives become familiar with the locally agreed procedure is echoed in Brown and Rogers (2008).

Pidgeon (2010) adds that written procedures for the emergency evacuation from a pool should also cover the degree of compliance of the mother and stage of labour or delivery.

A review of five New Zealand hospital protocols (Chapman, 2004) revealed that emergency scenario evacuation procedures are not covered in all protocols. The author acknowledges that although emergencies such as shoulder dystocia may be covered in midwife training on water births, emergency procedures laid down in a protocol would help to “...remind and assist staff of how to react should complications arise.”

In terms of equipment identified in the literature for emergency evacuation, Hammersley (2011) reveals that one NHS hospital's guideline for the use of water in labour identifies that a hoist should be available to use. Another NHS clinical guideline (Mc Cormick, 2011) recommends that an evacuation net be kept in the same room as the pool at all times. Boulton (2011) visited a hospital and reports that their emergency evacuation consisted of pre-positioning a lowered

trolley near the pool then adding to the water already in the pool so that it is filled to its maximum. Using the buoyancy of the water, a minimum of 4 personnel use a net and slide sheet to slide the mother from the pool onto the trolley. The net is kept some way away from the pool in a separate area on the unit where all the emergency equipment is kept. The rationale for this is that everybody knows where it is and that one of the midwives will collect it as she goes past the emergency area on her way to assist with the evacuation. Boulton (2011) comments that there are facilities within the pool room to store the net and it would seem sensible to store the net near its only point of use. It was also observed that a hoist is available but never used because midwives are not familiar with using it and do not consider themselves competent. Pidgeon (2010) identifies essential equipment for an emergency to consist of a net, inflatable swim collar to support the mothers head if needed and other floatation aids to support the mother's trunk.

The RCM (1999) suggests that due to the criticality of responding quickly to an emergency, *“the use of equipment such as overhead tracking hoists will normally be preferable to labour intensive procedures such as team lifting.”* If overhead hoist tracking with portable lifting devices are used they should be readily available and charged.

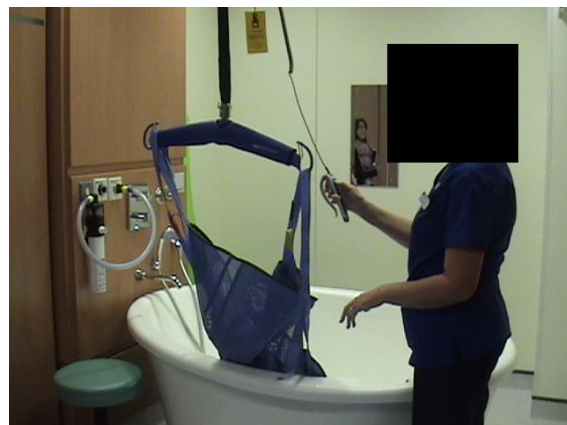
### 5.6.1 Insight gained from familiarisation visits

Regardless of whether on land or in water, emergencies are a rare occurrence. Two examples of emergencies were provided: shoulder dystocia and a haemorrhage. However, problems that could lead to an emergency are usually identified beforehand and consequently the mother should be able to exit the pool aided by the midwife / birthing partner before emergency interventions are required. The point that any problems should have been picked up before it gets to the emergency stage was a theme that was consistently made across all visits. The point was also made that although shoulder dystocia is an emergency, the mother may still be able to exit the pool by herself.

Emergency evacuation procedures differed across the units visited ranging from the use of nets to hoists.



**Photograph 24** Example of an emergency evacuation net



**Photograph 25** Example of a hoist used in an emergency evacuation

A preference was expressed for the use of a rescue net as a hoist track is considered unsightly and felt to detract from the appearance of the room. Additionally, midwives do not feel confident with using the hoist as it is not used often enough. A minimum of four people are required to use the emergency net, with each midwife holding two handles. Midwife shortages

were not perceived to be a problem if an emergency arose such that two more midwives were required (even on a night shift). It is understood that the net is positioned underneath the mother (aided by the buoyancy of the water) and she is transferred straight onto a bed that would be positioned next to the pool. A comment was made that the net process seemed easier and quicker than the hoist method. In an emergency, it was thought that in reality, manually removing someone out of the pool as a team lift would be quicker than waiting for a portable hoist. Some portable hoist designs would not be suitable in this situation as they could not be positioned close enough to the birthing pool and mother. However, it was acknowledged that the net method may not be appropriate for pools with steps around it. The net method was suggested as the preferred method for the new facilities to be built due to the expense of a hoist (around £5,000) and the low possibility of using it. However, hoists would be available in some new rooms (for high-risk patients).

The hoist method was preferred where there would not be enough midwives to call upon for the net method. The hoist observed on one visit was discrete and came with three sizes of slings (small, medium, large) although only one size would be in each birthing pool room. Consequently, in an emergency, the correct size sling would need to be identified and found. The procedure is that the bed would be brought close to the birthing pool for when the mother is lifted out of the pool. However, this would be dependent on the room as in one room there was no bed. The hoist mechanism was thought to be slow and it was considered quicker to move the hoist by hand. It is also essential that the hoist is stored in the correct position so that it remains charged.

It was stated that, whilst there have been emergencies; they have not required the use of a net. In these emergencies, the procedure would be to drain the water, give oxygen and give the mother manual assistance and support to get out of the pool. It was stated a number of times that the situation would be clinically managed before it gets to the emergency evacuation state.

## **5.7 TRAINING**

Every employer is responsible for providing as much information, instruction, training and supervision as is necessary to ensure, so far as reasonable practicable, the health and safety of their employees (HSWA, 1974). Training is vital in raising a midwives awareness of potential risks and their ability to recognise hazardous situations as they arise. Both the RCOG (2001) and the RCM (2000) endorse the use of water in labour as a choice provided that “*attendants have the appropriate skills and confidence to assist women who choose to labour or give birth in water*”. More recent guidance from these institutions in 2006 state that midwives should have access to training and protocols should be in place to support practice. MIDIRS (2005) recognise that clear strategies for the training, preparation and support of midwives who offer use of water during labour are essential. A national survey of maternity units in the UK in 2002 found that 67% reported having at least one midwife trained to provide support for women giving birth in water and 36% said that at least half of the midwives working in their unit were trained to support birth in water (MIDIRS, 2005). These figures however may have changed more recently.

### **5.7.1 Form of training**

A national study of labour and birth in water between 1993-1994 (Marchant, 1996) revealed that the most common forms of training or preparation for water births for midwives were the traditional resources of literature reviews, videos, special interest group meetings and study days. 78% of units reported such preparation and 21% collaborated with neighbouring provider

units or those with experience. However since this data is about 20 years old it is likely that most hospitals provide birthing pools and the extent of collaborating with neighbouring units may be diminished as a form of training and learning.

A study of Georgia midwives (Meyer et al, 2010) reveals that nearly all were aware of water births by reading an article, receiving a question about water birth from a mother and watching a video about water births.

The RCM (2000) comment that updating midwives knowledge by reviewing the research evidence is one training method to ensure that they are competent to provide support to women who choose to use water. However it is unclear how much of this research, if any, would concern manual handling. Not all New Zealand protocols reviewed by Chapman (2004) recommended that midwives attend manual handling training.

Workshops are another identified training method in the literature. Two out of the five New Zealand hospital protocols reviewed (Chapman 2004) provided water birth study sessions as a pre-requisite to water birth. McCloghury (2003) comments that a birth centre runs a weekly water birth workshop for clients that involves discussion role-play and video and similar workshops are also run for the midwives along with weekly reflection sections.

The literature suggests that training in water births via the educational route is not always provided. Although most water births in the US are supervised by Certified Nurse Midwives (CNMs) only 30% of the CNMs in a sample of midwives received education in their midwifery program about water births (Meyer et al 2010). Only a third to a half of midwives reported learning about water births either in their midwifery program, through witnessing a water birth or assisting with a water birth.

### **5.7.2 Content of training**

The literature (Brown and Rogers 2008, Boulton 2011) suggests that training courses should be delivered by those familiar with the challenges and influences of operating within that environment and consequently the courses should be relevant to the tasks that midwives undertake. The training should ensure midwives understand why it is important to adopt certain postures and avoid others. The techniques taught must be practical and take into account any performance influencing factors. There should be a method to ensure that all midwives have understood and can implement the training.

Boxall (2012) considers that there is not a great deal of reference material available for midwives advising on correct posture and manual handling outside of a clinical setting. In the community, Brown and Rogers (2008) recommend that all staff likely to be caring for the mother in the room must be familiar with the locally agreed procedure for getting a mother out of the pool, should there be complications, and practise it regularly in emergency drills. The emergency drills should include:

- Additional training in providing verbal guidance for the mother to get out of the pool independently
- The use of a net for the emergency evacuation of a mother or mother and baby from a birthing pool. This should address: fitting the net around the mother in the pool; lifting the mother out of the pool and onto a solid surface; and team handling

### **5.7.3 Insight gained from familiarisation visits**

In the UK, the RCM does not provide training and it is mostly down to the individual NHS Trusts. The RCM comment (2014) that the universities who offer midwifery courses provide an element of training in water births and it is considered likely that there will be a component covering manual handling but there is no standard module or consistency for this. It was thought that all student midwives have had the training in water births as it is considered a core midwifery competency.

Although the comment was made that training is provided in water births (e.g. study days, talks, workshops, training sessions which may or may not cover ergonomics issues) it appears that availability of the midwives due to the nature of the job, could be a potential issue for them attending a session. Consequently, training could be cancelled due to lack of numbers attending or the pool room may be occupied at the time so the training session is unable to go ahead.

A less formal training method is for midwives to learn by watching and getting involved. One training method identified was the making of an in-house training film to demonstrate the process. Often community midwives may not have the training / experience so they would have to come to a unit to acquire the skills for a water birth. One midwife commented that they are taught to walk around the birthing pool to reach the mother rather than lean across.

The view of emergency evacuation training was not consistent across the units visited. One view held was that emergency evacuation was a rare occurrence and consequently no formal training was required whilst other units did provide training for this.

## **5.8 HOME BIRTHS**

### **5.8.1 Guidance**

Boxall (2012) suggests that although 2.5% of women in the UK opt for a home birth (ONS 2011) there is not a great deal of reference material available for midwives advising on correct posture and manual handling outside of a clinical setting. Pidgeon (2010) reveals that a search for guidelines did not find any that were specific to home births but were adapted from their hospital guidelines. However, the adapted guidelines did not cover all the issues associated with home births.

### **5.8.2 Environment**

When working in a home setting, space and access can be critical and midwives may have little control over their environment. Gnash (2009), a community midwife, reveals that it is protocol to perform a home assessment at 36 weeks of pregnancy to assess the environment prior to the birth. Amongst the factors assessed is access to the property (e.g. working reliable lifts) and facilities within the property for inflatable pools.

Hughes (2011), a midwife at an independent practice, indicates that the space can be an issue at a home birth “...*If the woman decides to birth elsewhere in the house (usually the smallest room...)*”. Consequently, it is essential that planning a home birth should include a risk assessment of the space within the home. Brown and Rogers (2008) also identify the position of the pool within the home as a key factor. Sufficient space will be required so that the pool is accessible from all sides in order that the mother can be evacuated and is able to lie on the floor if necessary to allow the midwife to attend to her needs.

Another risk factor in the home environment, highlighted by Brown and Rogers (2008), are potential tripping hazards from floor coverings and equipment around the pool. To reduce the risk it is important to ensure objects on the floor are moved once they are no longer required such as the hosepipe used for filling/topping up the pool. There may be an increased risk of slipping especially where water has been spilt on tiled floors and therefore it is important to have the equipment available and someone available to mop up water spillages. Consequently, the removal of unnecessary clutter and obstacles should be included in the planning stage and the risk assessment explained to and signed by the mother to confirm awareness and understanding of the risks.

### **5.8.3 Equipment**

A mother may choose to buy her own birthing pool or to hire one from the hospital. It is the mother's responsibility to organise the provision and set up of the pool.

For a planned home birth, equipment is taken to the house at around 37 weeks gestation and Hughes (2011) suggests a birth kit including torches and a waterproof sonic aid should be included. This equipment will facilitate the midwife to assess of the mother and may reduce the potential for emergency evacuation. Brown and Rogers (2008) and Pidgeon (2010) suggest the following additional equipment that a midwife may require for a home water birth:

- Collapsible seat / step for the midwife to use to reduce prolonged periods of kneeling (this will also help the mother to enter or exit the pool)
- Head torch (to free up hands e.g. during stitching)
- Waterproof non-slip shoes.

### **5.8.4 Emergency evacuation**

Although home births are usually a safe option for low risk mothers, if an emergency evacuation from a birthing pool is needed, this carries greater risk to the midwife than an emergency evacuation from a birthing pool in a hospital. This is because fewer individuals are likely to be present at the home so there may be a delay in getting assistance. Pidgeon, (2010) Brown and Rogers (2008) suggest that there needs to be a contingency plan if the birthing partner is unable to assist in an emergency. They recommend that a written procedure is provided for emergency evacuation. This should be a laminated sheet and be kept in the birthing bag so that it is available for all staff involved in home water births.

Hughes (2011) identifies emergency equipment but only identifies those for baby rather than getting the mother out of the pool should an emergency occur. Brown and Rogers (2008) recommend the following equipment for emergency evacuation in the home environment:

- Net
- Inflatable swim collar (this could be used to support the mothers head if needed while waiting emergency help)
- Foam fun noodles to support the mother's trunk (the mother should try using these beforehand)
- Emergency evacuation table

### **5.8.5 Mother's wish**

An additional factor when assessing the risks associated with home births may arise from the strong desire of a mother to have a home birth. This may make it very difficult for the midwife to remain detached when assessing the risks and advising the mother if there are concerns. However, regardless of the setting, midwives must respect the mother's right to refuse advice given. Gnash (2011) provides a case study of a couple's wish for a water birth on a boat. In this case there was little alternative but to work with the mother's request and the lessons learnt from this experience include asking more questions during antenatal care of any mother requesting a home birth, and for a senior midwife to attend visits where there are unusual circumstances.

### **5.8.6 Insight gained from familiarisation visits**

At the units visited, it was considered the mother's responsibility to obtain a birthing pool for a home water birth although one hospital mentioned that they hire out an inflatable pool free of charge. One midwife is present during labour and a second is called at the stage of delivery as is practice in a hospital setting. Community midwives are not necessarily trained in water births yet if a mother in their care requests one they would need to acquire the appropriate training.

Community midwives carry out a risk assessment prior to labour to assess where the birthing pool can be situated ensuring there is adequate space around the pool so that the mother can get out and also that the strength of the floor is adequate to hold the weight of a large volume of water in a birthing pool. Consideration is also given to access for the emergency services e.g. difficulties arising from access to a block of flats.

There was no distinction made between community and hospital protocols and risk assessments. It was commented that the only difference is the type of pool (inflatable) and consideration of how it is positioned in the room.

Additional equipment (such as steps or a ball which may improve the posture and comfort of the midwife) are not provided in the home. As home water births are usually only an option for low risk pregnancies, the chances of complications are considered low. However if an emergency does arise, views were that:

- The two midwives present would physically lift the mother
- Use of an emergency evacuation net would not be suitable due to not enough people being present to assist
- Other people present within the home environment (e.g. birthing partner) would assist the two midwives to physically handle the mother out of the birthing pool
- No attempt would be made to remove the mother from the pool. The midwives would call an ambulance and then support mother and baby so that their heads were out of the water and they were made comfortable until help arrived
- Two midwives, birthing partner and ambulance crew physically handle the mother
- Bursting the pool is not an option to reach the mother in an emergency due to the large volume of water.

## 6. SUMMARY

The HSE incident statistics in relation to birthing pools indicate that manual handling related injuries to midwives are the most common (both in a hospital and home environment). It was identified from the limited information provided in the incident description that a combination of the position of the mother in the birthing pool and the tasks undertaken by the midwife are contributors to midwives adopting poor postures. Additionally, the exit of a mother from a birthing pool may lead to the midwife actively supporting the mother's weight or the mother using the midwife as a support, which may lead to a manual handling related injury.

There are few statistics available on the number of water births or the number of women who labour in water. However, as expected, midwives in midwifery led units will assist in more water births than those on maternity wards where higher risk mothers will be cared for in a more clinical environment.

Little research was identified in the literature review concerning the manual handling risks associated with midwifery and birthing pools. The research in this area tended to focus on the pros and cons for the baby and mother rather than the midwife. This focus on the mother and baby also is the mind-set of the midwife and therefore any recommendations to reduce the risks to midwives should be tailored accordingly.

Use of birthing pools is typically restricted to mothers assessed as low risk, which includes a maximum Body Mass Index (BMI) criterion. This cut off figure differs between maternity units and ranges between 35 – 40. However, if a mother does not fit the low risk criteria, she is still able to request and have a water birth but would need to be aware of the associated risks / risk assessment.

Typical tasks undertaken in a birthing pool are the same as those taken on land. The use of a birthing pool means that measures need to be taken to ensure the midwife can get as close as possible to the mother. The following suggestions are ways that may improve the posture of the midwife assisting in a water birth:

- Appropriate height of pool side relative to the mother and midwife
- Pool sides indented or curved with an undercut to allow knee / feet room for the midwife
- Use of steps, raised platform, seat ,stool (e.g. saddle) or chair
- A raised or integral seat inside the pool to position the mother nearer to the midwife
- Equipment designed to be waterproof, lightweight and easily held. Suggestions include a long handled mirror to facilitate easier monitoring
- Mirrored surface on the bottom of the pool to make observations more easily
- Underwater lighting.

This research reveals that the entry and exit of the mother into the pool is a key activity where manual handling related injuries may occur. Not all birthing pools are designed with integrated steps and handrails so consequently suitable additional aids that are compatible with the birthing pool, such as grab handles and portable steps, should be available to minimise the risk of the



mother slipping and the midwife feeling the need to physically assist. Also, slip resistant flooring around the pool area in a hospital or home will help to reduce the risk of slips and the need for a mother to use the midwife as a support.

The two main methods reported for removing the mother from the pool in an emergency are a patient hoist (and sling) or a purpose designed lifting net. These methods are rarely used because most situations are clinically managed before it gets to an emergency evacuation state. This research revealed that the hoist method was least preferred as it was described as slow and cumbersome, it was felt not to fit into the aesthetics of the room and staff were not confident in its use due to being given limited (or zero) training. Additionally, if the hoist is electric and not stored correctly it will not charge. However, for units with limited numbers of midwives, the hoist method is preferred as a minimum of 4 staff would be required for the net method. The net method was viewed as a much quicker (and cheaper) method of evacuating the mother from the pool although it requires considerably more manual handling than using a hoist and relies on more staff being available in an emergency. One incident reviewed in this research described an injury that occurred as a result of a practice emergency evacuation using the net method.

This research has identified a potential lack of training for some midwives in the emergency evacuation procedures. The universities which offer midwifery courses provide an element of training in water births and it is considered likely by the Royal College of Midwives (RCM) that manual handling will be covered in this. However, there is no standard module for consistency, as each NHS Trust provides its own training. Therefore, not all midwives may be trained in water births, but may learn by observing and aiding others, or by attending study days if provided by the individual Trusts.

The risk of manual handling injury is exacerbated in the home setting as, despite planning, there is typically less control over environmental factors. In addition, the design of the pool is fundamentally different, there may not necessarily be any emergency equipment to evacuate the mother from the pool, and there will be fewer people available to assist. Additionally, it is less likely that equipment will be brought to the home to aid the midwife's posture or comfort, or to aid the mother in and out of the pool.

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## 8. APPENDIX

The incident details provided here are reproduced verbatim from the original records, so therefore have not been rephrased or corrected for spelling and grammar.

**Incident No: 827890**

Incident Date	01/02/2004
Occupation of IP	Midwife
Age of IP	29 years old
Incident Location	Labour ward
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	IP was looking after a lady in the birthing pool, during this time IP sustained a back injury. IP was extremely busy on this shift as there is only 3 midwife's to 6 patients.

Key Factors:

- Time/work pressures

**Incident No: 713757**

Incident Date	07/10/2003
Occupation of IP	Midwife
Age of IP	22 years old
Incident Location	Delivery Room Seven In Delivery Suite
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	She was looking after a patient who was in the birthing pool and the patient was distressed and crying and she grabbed hold of the midwife for comfort and leant in the midwife with her weight. and that when the midwife felt pain in her back. She was seen in A&E and discharged to her GP. She went home herself and was fully mobile.

Key Factors:

- Distressed mother
- Mother using IP for support

**Incident No: 710433**

Incident Date	16/09/2003
Occupation of IP	Midwife
Age of IP	35 years old
Incident Location	Maternity
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Not Known
Body part Injured	Several locations
Description	IP injured her back in the birthing pool when delivering a shoulder dystocia. Had to help the patient out of the pool as unable to deliver in the pool. IP raised patient's (L) leg to assist deliver. IP suffered Pain (R) side & unable to weight bear on (R) leg. The procedures are currently being reviewed for this type of incident. IP was booked in for refresher manual handling training during the period she had off sick and is now booking a subsequent session.

## Key Factors:

- Task: shoulder dystocia delivery
- Assisted evacuation from pool
- Midwife supporting mother (raising mother's leg)
- Dated manual handling training?

**Incident No. 891769**

Incident Date	24/03/2004
Occupation of IP	Midwife
Age of IP	48 years old
Incident Location	Patients home
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	IP called out to home birth using birthing pool. Medical condition required auscultation of fetal heart, every 15 mins. At 2:000 am the patient was in the birthing pool, and did not like to be disturbed, so IP had to lean into birthing pool to undertake task. When patient had to leave pool, had to be dealt with on the floor, due to no suitable furniture being available. IP went to doctors next day and went off work. Incident report was initially not connected with person off work, as cause was not established on sickness notes. This matter has been discussed with the Modern matron, to review sickness notes in case related to incidents. Also, new HR system being introduced, which should assist in identifying these issues at an early stage.

## Key Factors:

- Task: repeated fetal heart auscultation every 15 minutes due to medical condition

- Mother position (did not like to be disturbed)
- Posture: leaning into birthing pool
- No height appropriate furniture available for care after pool. Mother was on floor level

**Incident No. 1158596**

Incident Date	22/01/2005
Occupation of IP	Care Assistant
Age of IP	28 years old
Incident Location	██████ birthing unit
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through pushing/pulling loads
Nature of Injury	Strain
Body part Injured	Back
Description	Strained back whilst removing liner from birthing pool. Injury not noted until next day.

Key Factors:

- Task: removing liner from pool

**Incident No. 938516**

Incident Date	28/04/2004
Occupation of IP	Midwife
Age of IP	42 years old
Incident Location	Water pool Room
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	ICC Summary of attachment:- IP hurt her back whilst assisting in a difficult water birth. Risk assessment was requested. A heavy plug in the pool was replaced.

Key Factors:

- Difficult birth
- Heavy Plug

**Incident No. 912688**

Incident Date	29/05/2004
Occupation of IP	Nursing auxiliary

Age of IP	40 years old
Incident Location	Ward 8
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	IP was bending over birthing pool to put the plug in, she felt a sudden sharp pull in back. Did not report at the time - 3 days later. Has been off sick since. Further investigation to follow.

Key Factors:

- Task: putting plug in pool
- Posture: bending over pool

**Incident No. 1382706**

Incident Date	08/12/2004
Occupation of IP	Midwife
Age of IP	30 years old
Incident Location	Patients home
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	n/a
Body part Injured	Back
Description	In attending a home water birth, the client was quite obstructive and difficult, often declining or becoming verbally aggressive when IP needed to listen to the fetal heart during the second stage. Second midwife in attendance. Due to the position of pool and the client being obstructive IP had to stretch and this is when IP believes IP slipped 2 x discs. Accident form completed in November 05 by IP. Witness statement from supervisor of midwives, who was in attendance during the birth, is unable to recall IP injuring her back during the birth.

Key Factors:

- Uncooperative mother: obstructive/difficult/verbally aggressive
- Position of pool (unable to ascertain why from brief description)
- Posture: Stretch into pool

**Incident No. 1365148**

Incident Date	27/11/2005
Occupation of IP	Nurse



Age of IP	38 years old
Incident Location	Midwifery Unit
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	The IP sustained a back injury whilst caring for a patient in the birthing pool. When leaning over the pool to examine the patient, her back went into spasm and she dropped to her knees and could not get up. Three staff members assisted her to a room opposite the pool, and the SHO on duty examine the IP. IP attended a Moving and Handling course on the 13th of February 2003. A copy of the incident has been forwarded to the moving and handling team.

Key Factors:

- Posture: Leaning over the pool
- Task: Examine mother

#### **Incident No. 1314919**

Incident Date	21/09/2005
Occupation of IP	Midwife
Age of IP	29 years old
Incident Location	Low Risk Maternity Suite
Severity of Injury	Over 3 day injury
Cause of Injury	injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	Was assisting a birth in the birthing pool, felt pain in back. Worked rest of shift then was off duty for two days, came back to work but had to go home as pain increased. Signed off by GP.

Key Factors:

- Assisting birth (no detail)

#### **Incident No. 1198667**

Incident Date	02/04/2005
Occupation of IP	Midwife
Age of IP	50 years old
Incident Location	Labour Ward
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back

Description	Attended delivery in birthing pool - suffered strain to back
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Key Factors:

- Attending delivery (no detail)

**Incident No. 1627213**

Incident Date	05/07/2005
Occupation of IP	Midwife
Age of IP	41 years old
Incident Location	Patients home
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	The IP attended a planned home birth. The client had hired a birthing pool. Some leaning and twisting was involved from the IP as the sides of the pool were low. The IP sustained back ache after delivery. No major ill effects till two or three days later. The IP has ongoing pain ever since. The IP got up for work in July 2005, but was unable to move and she was off sick for three days. She returned to work with some pain which was resolved by attending a chiropractor. One year on in July 2006 the IP got up for work again and unable to move. The IP is alleging that this is in connection with the incident. She did not report anything formally at the time. She has now been off for six weeks. ICC Note - "This report has missing data and has been completed to the best endeavour of the ICC". Unable to contact Notifier to ascertain Part B Address. Saved as "Not Known" and "Reportable" as best judgement.

Key Factors:

- Pool design: low sides
- Posture: leaning and twisting into pool

**Incident No. 1828693**

Incident Date	18/03/2007
Occupation of IP	Midwife
Age of IP	42 years old
Incident Location	Maternity
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Lower limb
Description	Assisting with water birth, stretched forward to bring baby to the surface

	however the mother pushed herself back i.e. away from IP leading to IP needing to over stretch to reach baby.
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Key Factors:

- Posture: Stretching
- Task: Bringing baby to surface
- Mother position

**Incident No. 1543861**

Incident Date	19/06/2006
Occupation of IP	Midwife
Age of IP	31 years old
Incident Location	Delivery Room (Birthing Pool) Maternity unit
Severity of Injury	Over 3 day injury
Cause of Injury	Slipped on wet surface or other substance
Nature of Injury	Strain
Body part Injured	Back
Description	IP was working a night shift. She was called to assist midwife with water birth in delivery room. As IP went to fill pool with more water she slipped on unseen puddle of water twisting her right hip and leg under her body and strained her back. IP continued her shift with pain in her back. IP has previously suffered from acute back strain. She attended Chiropractor next day whom diagnosed lower lumbar strain and she was signed off work by GP for 1 week. At time of accident, pool floor had been dried on several occasions and extra coverings were in place as husband had kept getting in and out of pool. IP is to be referred to Occupational Health before return to work. Staff awareness on potential hazards around use of birth pools is in hand to be reviewed.

Key Factors:

- Night shift
- Slipped on unseen water
- Extra coverings in place on floor
- Partner of mother kept getting in/out pool

**Incident No. 1520862**

Incident Date	29/05/2006
Occupation of IP	Midwife
Age of IP	44 years old
Incident Location	Labour Ward, Delivery Room.
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain

Body part Injured	Neck
Description	IP Was assisting at a waterbirth and there was difficulty delivering the shoulders. After the delivery the IP felt pain in their neck.

Key Factors:

- Difficult birth (shoulder dystocia)

#### Incident No. 2051769

Incident Date	04/01/2008
Occupation of IP	Midwife
Age of IP	46 years old
Incident Location	Birth Unit
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	Following waterbirth delivery IP leant over into pool to untangle cord and bring baby to the surface when she injured her back.

Key Factors:

- Posture: Leaning into pool
- Task: Untangle cord
- Task: Bring baby to surface

#### Incident No. 2043110

Incident Date	19/11/2007
Occupation of IP	Midwife
Age of IP	unknown
Incident Location	Central delivery suite (birthing pool room)
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Upper limb
Description	DURING AN EVACUATION PRACTICE OF THE BIRTHING POOL, THE IP HURT HER LEFT SHOULDER IN THE PROCESS. THIS INJURY WAS ORIGINALLY ONLY 2 DAY SICKNESS PERIOD AT TIME OF INCIDENT AND NOT A RIDDOR REPORTABLE INJURY. BUT NOW I.P.HAS GONE OFF SICK WITH SAME INJURY 5+ DAYS SO NOW REPORTING AS A PRECAUTION MEASURE.

Key Factors:

- Evacuation (a practice)

#### Incident No. 2024899

Incident Date	27/06/2007
Occupation of IP	Midwife
Age of IP	24 years old
Incident Location	Maternity, Labour Ward, [REDACTED]
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	Caring for a client in the birthing pool. Leaning over the pool to listen in to the fetal heart using a sonicaid. Fetal heartbeat low, asked client to get out of pool whilst still leaning over side of pool listening in. As the client stood to get out of pool supported herself by putting body weight on my back, forcing me further over side of pool. I tried to resist as did not want face to be submerged in water, caused client to put more body weight on me to support herself. Had to continue looking after client until delivery at 2345 (approx) and finished shift at 0745 28.06.07. After looking for advice on this website did not see GP straight away, continued to mobilise and try to stay active, got continually worse on days off, on returning to work 03.07.07 knew I could not continue and went to A&E.

#### Key Factors:

- Posture: Leaning over the pool
- Task: listening to fetal heart rate using sonicaid
- Mother using IP for support to get out whilst IP leant over pool
- IP tried to resist submerging face in water

#### Incident No. 2013940

Incident Date	15/11/2007
Occupation of IP	Midwife
Age of IP	42 years old
Incident Location	Pool Room in Birth Centre
Severity of Injury	Over 3 day injury
Cause of Injury	Injury while handling/transferring a person
Nature of Injury	Strain
Body part Injured	Back
Description	IP was assisting a woman who was quite distressed from the birthing pool to the bed. The husband was supporting one side and IP was on the other. The woman suddenly grabbed at IP and sunk to the floor. IP took the sudden weight (large body) but also twisted as she tried to stop the woman injuring herself. The

	woman was then encouraged to bear her own weight, helped to heel and supported from the bedside. It was difficult to get the woman on to the bed and took 3 people to support the manoeuvre. The woman was in normal labour and had not had narcotics. IP was off side 16-11-07 and was then on annual leave. She saw her GP on 19-11-07 who signed her off for the week. As line manager, I was not aware of this until yesterday. She had informed another member of staff who omitted to amend the duty rota, before them self being off sick. IP has occupational health referral 95.
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Key Factors: (Not in pool)

- Distressed mother
- Moving from pool to bed
- IP supporting mother (large body)
- Difficult to get mother on bed

#### Incident No. 1798230

Incident Date	04/04/2007
Occupation of IP	Midwife
Age of IP	34 years old
Incident Location	MATERNITY
Severity of Injury	Over 3 day injury
Cause of Injury	Slipped on wet surface or other substance
Nature of Injury	Fracture
Body part Injured	Toe
Description	LADY IN BIRTHING POOL, WATER SPLASHED ON THE FLOOR, IP DIDN'T NOTICE AND SLIPPED, HITTING HER TOE ON THE RAISED FLOORING AROUND THE POOL. NONE SLIP FLOORING IS ON THE POOL SURFACE, STAFF WERE AWARE THAT SPILLS ARE USUALLY CLEARED. REVIEW OF SURROUNDING FLOOR SURFACES TO RISK ASSESS WHETHER COMPLETE NONE SLIP FLOORING IS REQUIRED.

Key Factors:

- Slipped on unseen water
- Raised flooring around the pool
- Floor surfaces with no non slip floor?

#### Incident No. 2565803

Incident Date	30/03/2009
Occupation of IP	Midwife
Age of IP	Unknown
Incident Location	Birthing Centre
Severity of Injury	Over 3 day injury

Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	helping lady in labour in the birthing pool. Birth was becoming traumatic for mother as child had shoulder dystocia. IP was applying suprapubic pressure and as lady pushed she pushed down on IP s shoulder.

Key Factors:

- Traumatic birth (shoulder dystocia)
- Task: IP applying suprapubic pressure
- Mother using IP for support

**Incident No. 2488794**

Incident Date	23/03/2009
Occupation of IP	Midwife
Age of IP	47 years old
Incident Location	Maternity Unit
Severity of Injury	Over 3 day injury
Cause of Injury	Exposed to or contact with a harmful substance due to failure, leak or burst from equipment
Nature of Injury	Chest pains, Irritable cough
Body part Injured	
Description	Cause: Whilst cleaning out a birthing pool in the maternity department with 10 (Actichlor-Plus) disinfectant and cleaning tablets manufactured by (Ecolab) diluted in one liter of water IP felt chest pains tightness and developed an irritable cough. Action taken: Staff using Actichlor tablets have been informed to dilute them in cold water not hot water as this dramatically increases the amount of fumes being produced.

Key Factors:

- Cleaning birthing pool
- Diluting tablets in hot water?

**Incident No. 2353600**

Incident Date	10/11/2008
Occupation of IP	Midwife
Age of IP	46 years old
Incident Location	Patients home
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Strain
Body part Injured	Back
Description	IP was assisting with waterbirth delivery at patients home. This involved

	bending over low birthing pool. When assisting the patient from the pool with the help with the patients partner the patient felt faint and leaned heavily on midwife until further assistance quickly arrived. Incident form passed to manual handling advisor for review and investigation. ICC Note - This report has missing data and has been completed to the best endeavour of the ICC. Unable to contact notifier to obtain more information concerning part B. Saved as originally received and Reportable saved as best of judgement.
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Key Factors:

- Posture: Bending into pool
- Pool design: Low sides
- Assisting mother from pool
- Mother using IP for support (mother felt faint)

**Incident No. 2248533**

Incident Date	28/07/2008
Occupation of IP	Midwife
Age of IP	32 years old
Incident Location	Delivery Suite Room 1
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	IP was caring for patient in pool needing to lean over pool unable to move properly following water birth. IP sickness certified by GP and medication prescribed

Key Factors:

- Posture: Leaning over the pool

**Incident No. 2247886**

Incident Date	20/06/2008
Occupation of IP	Midwife
Age of IP	44 years old
Incident Location	LDRP in the [REDACTED] Building
Severity of Injury	Major injury
Cause of Injury	Slipped on wet surface or other substance
Nature of Injury	Fracture
Body part Injured	Upper limb
Description	[REDACTED] Accident happened in maternity ward, in private bedroom when mother-to-be



	<p>was in labour using birthing pool. The m-t-b had left the birthing pool and walked through to the bedroom area and when the midwife returned she slipped on water that had dripped. The birthing pool was located in the bathroom area which has a slip resistant flooring, however the flooring in the bedroom is not slip resistant.</p> <p>The risk assessment for the area had not considered slips risks but has since been revised.</p> <p>There are plans for a new birthing unit to be built which will have fixed permanent birthing pools and all the floorings will be slip resistant. This is likely to be opening in about 1 year from now.</p> <p>Advised there would need to be some temporary measures put in place to ensure risk reduced prior to the new unit being built. It was suggested that m-t-b would be asked to dry themselves prior to leaving the bathroom area but I discussed that this is unlikely to be sufficient to reduce the risk. Discussed needing to introduce some physical controls rather than solely relying on processes and human factors e.g. matting etc. H&amp;S advisor to report back to me with regards progress.</p>
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Key Factors:

- Slipped on water
- Non slip flooring

**Incident No. 2758612**

Incident Date	25/12/2009
Occupation of IP	Midwife
Age of IP	37 years old
Incident Location	Home
Severity of Injury	Over 3 day injury
Cause of Injury	Slipped on wet surface or other substance
Nature of Injury	Contusion
Body part Injured	Toe
Description	<p>While attending a home water birth. IP was walking around the pool to collect equipment in preparation for transfer of women and baby to hospital. IP slipped on water/plastic/wooden floor. IP continued to care for the women despite being in excruciating pain. Paramedics offered to transfer IP to A&amp;E but she declined wishing to sort the women and baby out first. IP attended A&amp;E the following morning. Signed off sick for two weeks. Health &amp; Safety Team notified by Risk Management. 13-01-2010 re incident to IP - due to delay in reporting requested urgent confirmation from the Manager of IP s injury and details of the exact location of the clients home. Email from Community Midwife Manager confirmed absence from 25th December 2009 to 11th January 2010 personal details also confirmed. Awaiting clients details. 14-01-2010 Clients details obtained F2508 completed local investigation to be undertaken by Manager. IP has returned to normal duties.</p>

Key Factors:

- Slipped on floor (water/plastic/wooden floor)

**Incident No. 2750231**

Incident Date	08/12/2009
Occupation of IP	Midwife
Age of IP	50 years old
Incident Location	Maternity Department
Severity of Injury	Over 3 day injury
Cause of Injury	Injured while manually handling or supporting a person
Nature of Injury	Contusion
Body part Injured	Several locations
Description	Patient in second stage of labour in birthing pool on knees leaning on a pillow on the rim of the pool Midwife lent over when patient had a contraction to check if baby s head was visible. When straightening up felt a pain like an electric shock radiating down back and right leg. Severe pain in back and no feeling in right leg following this.

Key Factors:

- Posture: Leaning over
- Task: Checking for signs of baby's head

**Incident No. 2662166**

Incident Date	18/08/2009
Occupation of IP	Midwife
Age of IP	46 years old
Incident Location	Maternity
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through carrying loads
Nature of Injury	Strain
Body part Injured	Back
Description	IP states lower back pain caused by carrying for a mother using the birthing pool. IP states that whilst back was still tender she twisted and pulled something causing acute back spasm and reduced mobility resulting in 8 days sickness absence

Key Factors:

- Posture: Twisted

**Incident No. 2526678**

Incident Date	14/05/2009
Occupation of IP	Midwife

Age of IP	29 years old
Incident Location	[REDACTED]
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	The forementioned IP sustained a sharp pain in the Sacrum area of her back when she returned to a standing position after monitoring a patient in a birthing pool. The IP had been monitoring the heartbeat of the baby by kneeling next to the pool and leaning in the patient had been in the pool for approximately an hour and a half. The IP finished her shift on the morning of the 15th May phoned in sick on the 17th May and after a consultation with her GP on the 18th May she has been signed off sick until 25th May 2009. If the IP's symptoms do not ease or get worse than she is to return to her GP. Currently she is managing the discomfort with Nurofen and Paracetamol. The GP has diagnosed a back strain indicating that it is muscular. Delivery Suite Manager [REDACTED] is retrospectively filling in the incident form as it was not carried out during the shift when the incident occurred. (Number 76770) [REDACTED] is to contact Occupational Health and start the process for arranging fast track physiotherapy for the IP's return. As this injury is not a result of an actual accident GD contacted the HSE Incident Contact Centre ([REDACTED]) who confirmed this incident as RIDDOR Reportable

Key Factors:

- Task: monitoring heartbeat of baby
- Posture: Kneeling and leaning
- Mother in pool for approximately 1.5 hrs.

**Incident No. 2975087**

Incident Date	13/07/2010
Occupation of IP	Midwife
Age of IP	54 years old
Incident Location	Home
Severity of Injury	Over 3 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Back
Description	IP was providing care to a mother birthing at home in the birthing pool. The IP needed to listen to the fetal heart rate and asked the mother to change position the mother declined and the IP overstretched. Backcare team to investigate

Key Factors:

- Task: Listening to fetal heart rate

- Uncooperative mother : Asked mother to change position but she declined
- Position of mother
- Posture: Overstretched

**Incident No. 3231325**

Incident Date	01/06/2011
Occupation of IP	Midwife
Age of IP	29 years old
Incident Location	██████████ Birthing Pool Room 1
Severity of Injury	Over 3 day injury
Cause of Injury	Slipped, tripped or fell on the same level in another way not specified
Nature of Injury	Contusion
Body part Injured	Trunk
Description	The IP was working in a birthing pool room when she slipped whilst leaning over the side of the pool to apply pressure to an unclamped umbilical cord. The IP fell forward on her stomach on the side of the pool. The IP completed her shift (07.30) but was unable to work on a night shift on 1.6.11. The suffered a bleed and is known to be pregnant. The IP was seen by a GP on 2.6.11 and has had three HGC blood tests. The IP was due to be off as a result of her shift pattern but would not have been emotionally fit to carry out her normal duties until 6.6.11. The IP returned to work on 7.6.11. The birthing pool rooms are fitted with anti-slip flooring.

Key Factors:

- Task: applying pressure to an unclamped umbilical cord
- Slipped
- Posture: Leaning over side of pool

**Incident No. 5DDE04F6CD**

Incident Date	20/03/2012
Occupation of IP	Midwife
Age of IP	40 years old
Incident Location	██████████ Birthing Suite
Severity of Injury	Over 3 day injury
Cause of Injury	Lifting, carrying, standing up
Nature of Injury	
Body part Injured	Back
Description	Member of staff was assisting with a difficult delivery of baby. Water birth - Mum had high BMI and large baby being delivered. Correct procedures followed for Mum and staff to ensure a safe delivery. The Mum had been offered offered stirrups but had declined so partner was supporting her left leg and unexpectedly let go of her leg at the point of delivery of the head, which fell onto the member of staff whilst she was positioned to aid delivery. Both members of staff then completed McRoberts procedure to ensure safe delivery of baby. Intense pain after event, muscular spasms. Visited GP and occupational health - off work for several weeks. Lateness of reporting incident

	due to staff not following correct Trust procedure for reporting incidents. Member of staff now returned to work, is now aware of correct procedure.
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Key Factors:

- Difficult delivery (large baby)
- Mother had high BMI
- Uncooperative mother: Mother declined stirrups
- Leg of mother fell on IP while positioned to aid delivery

**Incident No. 522B8BCA41**

Incident Date	17/11/2011
Occupation of IP	Midwife
Age of IP	30 years old
Incident Location	
Severity of Injury	Over 3 day injury
Cause of Injury	Lifting, carrying, standing up
Nature of Injury	
Body part Injured	Back
Description	IP was working in the Labour ward and was allocated to assisting a labouring woman (patient) who had opted for a water birth. The IP reported that patient was constantly getting in and out of the pool. On the last occasion, as the IP was assisting the patient out of the pool and down to the floor, suddenly the patient held tightly to the IP's shoulders and pulled the IP down. The IP immediately felt a twinge in her back and the next day developed numbness/pins and needles in the left foot and damage in the lower left back and left shoulder. The IP saw the Occupational Health team who advised the IP to see their GP, who referred the IP for a MRI scan. This diagnosed protruding of L3/L4/L5 vertebrae. Following the incident, the IP was off sick and during this time received physio and treatment from an Osteopath. The IP returned to work on 30.12.2011. On return to work, the IP is being monitored by the Occupational Health team and commenced on light administrative duties for 6 – 8 weeks in the Ante-natal department and lifting activities to be undertaken during this period.

Key Factors:

- Assisting mother out of the pool
- Mother using IP for support

**Incident No. B9717133E5**

Incident Date	30/03/2012
Occupation of IP	Midwife
Age of IP	52 years old
Incident Location	Birth Centre

Severity of Injury	Over 3 day injury
Cause of Injury	Lifting, carrying, standing up
Nature of Injury	
Body part Injured	Back
Description	Member of staff was looking after a patient in labour in the birthing pool. Before the delivery the mother to be wanted to exit the pool. Member of staff injured herself when assisting the mother to be. Continued to work on the day and then went off sick the next day when back was very painful.

Key Factors:

- Assisting mother out of the pool

**Incident No. 0725A39412**

Incident Date	31/10/2012
Occupation of IP	Healthcare Assistant
Age of IP	Unknown
Incident Location	
Severity of Injury	Over 7 day injury
Cause of Injury	
Nature of Injury	
Body part Injured	Back
Description	when helping to get a patient out of the birthing pool in labour for assessment the patient had a contraction and placed full weight onto shoulder of staff member. Patient grasped onto unifor and lent head heavily onto right shoulder during length of contraction

Key Factors:

- Assisting mother out of the pool (for assessment)
- Mother using IP for support

**Incident No. DE78E2F079**

Incident Date	30/04/2012
Occupation of IP	Unknown
Age of IP	Midwife
Incident Location	Delivery Suite, Building
Severity of Injury	Over 7 day injury
Cause of Injury	Twisting, turning
Nature of Injury	
Body part Injured	Back
Description	IP was assisting with a water birth. Babies shoulder became stuck and it was

	necessary for IP to react quickly in assisting in the delivery of the baby. Patient sitting at the bottom of the pool and it was necessary for IP to reach across the pool and down into the water in order to reach the baby. In doing this IP felt a crunch under her right arm pit followed by immediate sensation of pins and needles running up and down her arm. Subsequently diagnosed with a torn pectoral muscle. In fact the muscle had detached itself from the ligament of her right arm. Unable to work since the day of the accident.
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Key Factors:

- Difficult birth (shoulder dystocia)
- React quickly
- Mother position in pool
- Posture: Reaching into pool

**Incident No. 82C4F90999**

Incident Date	09/04/2012
Occupation of IP	Nurse
Age of IP	35 years of age
Incident Location	Labour Ward, Pool Room
Severity of Injury	Major injury
Cause of Injury	Slip, stumble or fall
Nature of Injury	
Body part Injured	Foot
Description	Slipped on water in the birthing pool room. Attended A&E and diagnosed a fracture to rightfoot. Area checked for leaks - none identified, pool to be reviewed by works as a precautionary measure. Pool in use caution notice for door created, minor amendment to be made to use of water in labuor guideline. Risk assessment completed.

Key Factors:

- Slipped on water

**Incident No. 870BC60AD9**

Incident Date	05/06/2012
Occupation of IP	Midwife
Age of IP	Unknown
Incident Location	Birth Centre
Severity of Injury	Over 7 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	
Body part Injured	Back

Description	Midwife [REDACTED] was assisting during a delivery on the birth centre during a water birth and noticed that she had backache afterwards. She felt unwell afterwards and has been off sick since. I have spoken to her this am (14th) and have referred her to occupational health and she has seen her GP for a sick note.
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Key Factors:

- Assisting during delivery (no details)

**Incident No. FB54085816**

Incident Date	27/02/2013
Occupation of IP	Midwife
Age of IP	Unknown
Incident Location	[REDACTED] Ward
Severity of Injury	Over 7 day injury
Cause of Injury	Injury through sprains/strains from body movement whether or not a load is involved
Nature of Injury	Strain
Body part Injured	Neck
Description	IP required to use extended reach in to pool during a water birth sustaining injury to neck and shoulder. No action taken as believed initial aching and stiffness would resolve spontaneously.

Key Factors:

- Posture: Extended reach

**Incident No. 4068A16DB8**

Incident Date	21/01/2013
Occupation of IP	Midwife
Age of IP	Unknown
Incident Location	Central Delivery Suite
Severity of Injury	Major injury
Cause of Injury	Kneeling, sitting or leaning on an object
Nature of Injury	
Body part Injured	Trunk
Description	Staff member leant into the birthing pool to listen to the fetal heart when the right side of their body impacted with the edge of the birthing pool, they felt an immediate pain in their ribs.

Key Factors:

- Task: Listen to fetal heart rate
- Posture: Leaning into pool



Additional incident provided with specification to project

Incident Date	
Occupation of IP	
Age of IP	
Incident Location	Labour Ward
Severity of Injury	
Cause of Injury	
Nature of Injury	Strain
Body part Injured	Back
Description	IP was involved delivery of baby via a water birth. Leading up to delivery, the IP states they were bending over birthing pool to auscultate. As labour progressed, auscultation was at five minute intervals and the labouring woman's ability to be assist by standing up decreased, resulting in the IP having to bend to carry out the regular checks of the baby's condition. The IP reports they experienced severe back pain after delivery of baby. The IP then took some analgesia and went home once the late shift staff had arrived. The IP was off work for 12 days during which time saw GP and received physiotherapy treatment (which they had been having privately prior to the incident). On return to work the IP was not allocated to work in the labour ward for four weeks.

Key Factors:

- Posture: Bending over pool
- Task: Auscultate at 5 minute intervals
- Mother's inability to stand up
- Task: delivery of baby





# Manual handling risks to midwives associated with birthing pools: literature review and incident analysis

This report describes research into the manual handling related risks to midwives associated with providing care to women choosing to use a birthing pool for labour and/or birth at home and in hospital.

The research comprised: a review of incidents reported to the Health and Safety Executive, a literature review and familiarisation visits to include discussions with midwives to identify current practices and procedures.

The manual handling risks are likely to result from the position of the mother in the pool, as well as from the position of the midwife whilst undertaking tasks at the birthing pool, and when actively supporting a mother's entry/exit into the pool or the mother using the midwife as a support whilst entering/exiting the pool. The risk of manual handling injury is exacerbated in the home birth setting, as, despite planning, there is typically less control over environmental factors.

The research suggests a need for the development of guidelines for good practice with regard to birthing pool, room and equipment design for both hospital and home birth settings. This is fundamental to reducing the manual handling risks to midwives and to enable the midwife to focus on the safety of the mother and baby.

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