MNSI
Maternity & Newborn Safety Investigations

# National learning report

## Factors affecting the delivery of safe care in midwifery units

Independent report by the
**Maternity and Newborn Safety Investigations programme**

**May 2024**

The programme of investigations into maternity and newborn safety incidents was previously overseen by the Healthcare Safety Investigation Branch (HSIB). It began in 2018 as part of the national initiative to improve safety in maternity care.

After the Health and Care Act 2022 was passed, HSIB went through a period of organisational transformation. The programme is now known as the Maternity and Newborn Safety Investigations (MNSI) programme. In October 2023, MNSI became hosted by the Care Quality Commission (CQC) under 2023 Directions. These Directions set out the referral criteria for MNSI investigations.

At the time of carrying out the investigations in this report, the MNSI programme was still part of HSIB. For this reason, you will see references to HSIB throughout the report.

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## A note of acknowledgement

We would like to thank the families whose experiences are included in this report. They generously gave their time, under profoundly difficult circumstances, during the maternity investigations into their care.

To protect the anonymity of the pregnant women, the report does not describe clinical details of their care or use their names.

We would also like to thank the healthcare providers and staff who participated in the maternity investigations for their openness and commitment to support improvements in this area of care.

## A note to those who are pregnant or planning pregnancy

We appreciate that reading this report may be concerning for women who are currently pregnant, those planning a pregnancy, or their families. It is important to acknowledge that during the period covered by the report, thousands of pregnant women experienced a safe pregnancy, labour and birth.

# About this report

**Note: This report uses the term woman or women throughout. MNSI acknowledges that not all pregnant or birthing people identify as a woman.**

This national learning report is intended for healthcare organisations, policymakers and the public. The report is based on a thematic analysis (a process that looks for common themes) of 92 maternity investigation reports, where the safety incident under investigation included care provided in a midwifery unit. The investigations were completed by HSIB before the Maternity and Newborn Safety Investigations (MNSI) programme moved to CQC.

The report relies solely on evidence from the maternity investigation reports and discussions with stakeholders from the wider healthcare system. There was no independent additional consultation with the women and healthcare staff involved in the incidents detailed in the investigation reports.

We share the themes, safety observations and prompts for midwifery units to help improve the safety of care provided to pregnant women in midwifery units. Importantly, the themes are also relevant to other birth settings, such as hospital obstetric units.

# Summary

## Introduction

This national learning report aims to identify factors that affect the delivery of safe care in midwifery units. To do this, it uses findings from investigations carried out by the Healthcare Safety Investigation Branch (HSIB) into maternity patient safety incidents.

Midwifery units are staffed by midwives and support staff. Typically, pregnant women who choose to give birth in a midwifery unit have been assessed as having a low chance of complications during labour and birth. Sometimes a pregnant woman or baby may need to be transferred from a midwifery unit to an obstetric unit (a hospital unit where specialist doctors are primarily responsible for their care) to receive additional care and treatment.

HSIB wishes to highlight that the analysis reflects care provided only for births where the outcome meets the criteria for referral for a maternity safety investigation. It is important to note that the vast majority of labours and births that have included care on a birth centre do not have an outcome that meets these criteria.

HSIB conducted a thematic analysis (a process to look for common themes) of 92 maternity investigation reports where the investigation had resulted in making safety recommendations to midwifery units in trusts.

The thematic analysis identified 4 main themes and findings, which include issues relating to:

1. **Work demands and capacity to respond** – the number of tasks needed to be done and whether there are enough (and suitable) staff, and appropriate physical space, to do them.
2. **Intermittent auscultation** – a method used to assess a baby's heart rate as an indicator of their wellbeing.
3. **How prepared an organisation is for predictable safety-critical scenarios**, and the role played by in situ simulation (a training method that involves staff rehearsing scenarios in the workplace).
4. **Telephone triage** – the assessment a midwife carries out when a pregnant woman telephones because they have gone into labour or have a concern about their pregnancy.

## Themes and safety prompts for midwifery units

It is important to note that the themes identified in this report are neither new, nor specific to midwifery units. All birth settings need to take action to address the safety risks associated with them to promote safe care.

Under each of the 4 main themes from the analysis, we set out findings and safety prompts. The safety prompts are intended to promote and support learning discussions within midwifery units and other birth settings, as well as influence the development of systems and processes to improve safety.

## Theme 1: Work demands and capacity to respond

Overall, the thematic analysis provided further evidence of the negative impact of inadequate staffing and high workload on the safety of care, as highlighted in previous national reports. In particular:

- When work demands exceed capacity, staff may be required to make a trade-off between efficiency and thoroughness. The thematic analysis found that the mismatch between demand and capacity often resulted in delays in care and/or safety-critical monitoring tasks during a woman's labour.
- The delivery of safe care in midwifery units is affected not only by the unit's own capacity challenges, but also by capacity issues in other organisations and areas it interacts with, for example obstetric units and ambulance trusts.

### Safety prompts

- How do you assess whether you have the right staff (numbers, skills, and experience) in your midwifery unit? Do you know the evidence base for the tools you use to assess staffing? When was your last formal staffing assessment?
- How do the results of your staffing assessment compare with:
    - the perceptions of those working in the unit
    - feedback from pregnant women birthing in the unit
    - any patient safety incidents?
- Do you regularly share information on staffing in your unit, and any concerns about staffing, with the:
    - trust's board
    - maternity safety leads
    - local integrated care board
    - midwifery networks
    - local maternity and neonatal voice partnership?
- How are staff supported to escalate when demand exceeds capacity?

## Theme 2: Reliability and sensitivity of intermittent auscultation

There are several different ways to monitor a baby's heart rate during labour. This report does not compare the different methods of fetal monitoring. Some of the findings here are also applicable to other methods of fetal monitoring.

Intermittent auscultation or 'listening in', is the recommended method of listening to a baby's heart rate in labour in pregnancies where there are no anticipated complications.

It is usually the method used when care is being provided in a midwifery unit and is part of a dynamic assessment of a mother and baby's wellbeing throughout labour.

- Intermittent auscultation was not carried out in line with national guidance in almost half (49%) of the maternity investigations analysed. This finding was often associated with a high workload.
- Evidence from the reports, together with published literature, suggests that carrying out intermittent auscultation as set out in guidance is difficult to achieve in practice. Research is underway to understand the reasons for this and to develop a toolkit to improve the way intermittent auscultation is carried out in practice.
- Intermittent auscultation is a complex task that relies on sustained attention, often over a 12-hour work shift.
- The environment in which intermittent auscultation is carried out may require staff to overcome physical challenges, such as a mother's choice of position and additional noise, which may affect clinical assessment.

### Safety prompts

- Do the midwives in your unit receive training on intermittent auscultation as part of fetal monitoring training at least once a year? How do you assess their competency? How do you explore whether staff feel confident and competent in intermittent auscultation?
- Do you know the extent to which midwives are able to comply with national guidance on intermittent auscultation monitoring (for example, by regular audit or feedback from them)?
- Do you explore and understand the reasons for any gap identified between guidance and the work carried out? Are these reasons reflected in your own investigation reports involving intermittent auscultation?
- Is a buddy system used in your unit to support midwives to objectively assess suitability to continue with intermittent auscultation at least every four hours?

## Theme 3: Organisational preparedness for predictable safety-critical scenarios

- The majority of the 92 investigation reports analysed involved predictable safety-critical scenarios, such as a pregnant woman, or their baby, needing to be transferred urgently to an obstetric unit. However, even with a published framework to support prospective risk assessment (identifying safety risks before they occur), there was limited evidence of unit-level prospective risk assessment happening to identify and address weaknesses in the systems and processes that units rely on in such scenarios.
- In situ simulation has been shown to be a useful way to rehearse safety-critical scenarios and prospectively identify and address issues and safety risks in current ways of working and work processes. Given the dependency on, and impact of, other clinical and health services on delivering safe care in midwifery units, in situ simulation would need to include relevant staff from these other areas to maximise learning and potential safety gains. In situ simulation complements the skills-based training for resuscitation of babies, required by all qualified staff providing maternity care.

### Safety prompts

- How do you prepare staff in your unit and test existing systems and processes for predictable safety-critical scenarios? For example, transferring a pregnant woman to an obstetric unit or resuscitating a baby born in poor health.
- Have you jointly developed standardised ways to communicate levels of urgency in relation to transfer with ambulance services and receiving obstetric units?
- Are relevant staff from other areas (such as the local obstetric unit and ambulance service) involved in developing your transfer procedures and pathway?
- Do birth planning discussions with pregnant women include the transfer arrangements and estimated time for transfer between the midwifery unit and obstetric unit?
- Where is the neonatal resuscitation equipment located for each room? Is it easily accessible and kept ready for use at all times?
- Do you prepare staff for predictable safety-critical scenarios by rehearsing through in situ simulation? If so, do you include all staff from relevant services such as the obstetric unit and the ambulance service for freestanding units?
- Do you carry out operational risk assessments every year? If so, do you use a structured framework or self-assessment tool such as the Midwifery Unit Standards developed by the Midwifery Unit Network and European Midwives Association?

## Theme 4: Telephone triage

When a woman suspects labour is starting or if they have other concerns, they would usually contact a telephone number provided to them. This service may be provided by staff working in a midwifery unit for mothers planning birth there, or by a central triage service. This review did not compare the service provided in different locations.

- There is variation in the advice and information given to pregnant women during telephone triage and how information about these calls is recorded. There is a higher risk of information being lost if a pregnant woman speaks to different staff in different geographical locations.
- Readily available and easily accessible clinical information supports effective telephone triage and decision making. However, using different digital information systems, and mix of handwritten and electronic systems, hinders staff in effectively triaging pregnant women.
- Providing multiple telephone numbers for multiple units (obstetric and midwifery units) for advice can create confusion and increase the risk of information being lost.

Despite the importance of telephone triage, national guidance to standardise and facilitate the process for providing consistent assessment and advice has only recently been published. The Royal College of Obstetricians and Gynaecologists has recently published a good practice paper, which includes a section relating to telephone triage.

### Safety prompts

- Do you have a standardised, structured process for providing telephone triage and the documentation of advice given? If so, has this been discussed and agreed with other relevant staff such as those providing telephone triage at the local obstetric unit?
- Can staff providing telephone triage easily access all relevant information systems?
- How do you gather feedback about the experiences of staff and pregnant women about telephone triage?

## HSIB safety observations

### Safety observation:

Maternity safety investigations can improve patient safety by considering factors known to affect the ease of using of intermittent auscultation, such as noise, physical constraints, and the ability of staff to maintain vigilance. This learning should be used to inform local guidance and training.

### Safety observation:

Midwifery units can improve patient safety by assessing themselves against the Midwifery Unit Standards to provide a prospective risk assessment and inform any necessary improvement plans.

### Safety observation:

In situ simulation can improve patient safety by bringing together multidisciplinary and multi-agency teams to enhance organisational preparedness and support prospective risk assessment. This complements skills-based training required by staff providing care in birth centres.

# Background and context

HSIB recognises the importance of choice of place of birth for women. The focus of this report is not to compare outcomes in one birthing environment with another; nor is it intended to influence a change in the choice of birthplaces available to women. Instead, the intention is to share the thematic learning identified through analysis of completed investigation reports, to be used alongside clinical guidance by staff working in and leading maternity services.

HSIB wishes to highlight that this thematic review included only births that had met the criteria for investigation by HSIB under these Directions.

This national learning report is based on an analysis of 92 HSIB maternity investigation reports on safety incidents that involved care in midwifery units. All the pregnant women/people involved needed to be transferred from a midwifery unit to an obstetric unit (a unit where care is led by doctors rather than midwives) because they, or their baby, needed additional care. The reasons for transfer, and eventual health outcomes, are detailed in Appendix A.

The methodology used to select completed investigation reports for this thematic review is described in detail in Appendix B.

## Midwifery units

A midwifery unit, sometimes called a 'birth centre' or 'midwife-led unit', is a location offering maternity care, which is staffed by midwives. Midwives are accountable and provide care autonomously in all birth settings. In a midwifery unit, midwives take primary professional responsibility for care. Midwives work in partnership with the multidisciplinary team, requiring systems to support this when needed. An example of this would be if a transfer to an obstetric unit was needed because progress in labour was not as expected.

Before it was common to give birth in a hospital, midwifery units in community settings were the main form of maternity care provision, along with home birth. Midwifery units are a part of an NHS trust's maternity service; governance and leadership are provided by NHS organisations.

Midwifery units can be:

- **Next to or 'alongside' a hospital obstetric unit**. In these midwifery units, different services are available in a different part of the same building, or in a separate building on the same site. These include:

    - medical, diagnostic, and treatment services, including obstetric (labour and birth)
    - neonatal (newborn) services
    - anaesthetic care.

    To access such services, pregnant women are transferred to the obstetric unit, normally by trolley, bed or wheelchair.

- **Located away from an obstetric unit or 'freestanding'**. In these midwifery units, medical diagnostic and treatment services and interventions are not available in the same building or on the same site. To access such services, pregnant women need to be transferred by ambulance or car. Freestanding midwifery units are part of a hub-type environment where access to other services such as health visiting is also provided in a community setting.

A pregnant woman may receive care in a midwifery unit:

- during their pregnancy and before they go into labour (antenatal care)
- through telephone or face-to-face assessments with midwifery unit staff (triage)
- during their labour and birth (intrapartum care)
- after the birth of their baby (postnatal care).

NICE (2023) recommends that all 4 birth settings are available to all women. Evidence suggests that for eligible women, birth centres are associated with optimal clinical outcomes, experiences for those using them and cost-effectiveness (Scarf et al., 2018; Macfarlane et al, 2014b; Schroeder et al., 2012).

The Midwifery Unit Network states that midwifery units "adopt and promote a bio-psycho-social model of care that addresses physical, psychological and social needs". They are staffed by midwives and support workers. Typically, pregnant women who choose to give birth in a midwifery unit are healthy and have been assessed as having a low chance of complications during labour and birth. Pregnant women with additional factors that mean birth in an obstetric unit is recommended, may also choose to plan labour and birth in a midwife-led birth setting.

Labour and birth do not always progress as expected. The pregnant women and babies whose experiences we include in this report needed to be transferred to an obstetric or neonatal unit where they also received care. Overall, evidence identifies that the chance of needing to transfer to an obstetric unit is 22.5% from a freestanding midwifery unit, and 26.5% from an alongside midwifery unit. Women having their first baby have an increased chance of needing to be transferred from a midwifery unit (36% require transfer from a 'freestanding' midwifery unit, 40% from an 'alongside' midwifery unit).

NICE guidance indicates that a personalised discussion is needed to support women in deciding where to have their baby.

# Fetal monitoring in a midwifery unit

There are several different ways to monitor a baby's heart rate during labour. This report does not compare the different methods of fetal monitoring. Some of the findings here may also be applicable to other methods of fetal monitoring.

Intermittent auscultation (IA) means listening at regular intervals. It is one method used to assess a baby's heart rate as an indicator of their wellbeing. For pregnant women who have been assessed as having a low chance of complications during labour and birth, guidance from the National Institute for Health and Care Excellence (NICE) 2022b recommends intermittent auscultation. Pregnant women giving birth in a midwifery unit typically fall within this group, so IA is routinely used in this setting.

IA is used to assess a baby's heart rate to detect:

- whether their heart rate is outside the expected range (a baby's normal resting (baseline) heart rate is between 110 and 160 beats per minute)
- whether there is a temporary slowing (decelerations) or temporary increase (accelerations) in the baby's heart rate
- whether there is a change in the baseline (the average rate of a baby's heartbeat over a period of time) of the baby's heart rate.

The tools used for IA are either:

- a hand-held Pinard stethoscope, which is a small trumpet-shaped device placed on the pregnant woman's abdomen
- an electronic hand-held ultrasound device known as a Doppler, which produces an audible sound of heartbeats.

Alternative monitoring equipment such as cardiotocography (CTG) provides a graph of a baby's heart rate and a pregnant woman's contractions. It is not routinely available or recommended for use in midwifery units. CTG monitoring is commonly used in obstetric units.

Labour and birth progress in stages. NICE provides the following guidance.

- When a pregnant woman is in the established first stage of labour (when they are having regular painful contractions and their cervix has opened to 4cm) IA should be carried out immediately after a palpated [felt by hand] contraction for at least 1 minute, repeated at least once every 15 minutes.
- Once a pregnant woman has signs of, or is in confirmed, second stage of labour (when their cervix is fully open to 10cm and they are pushing their baby through the birth canal, or the baby is visible) IA should be carried out immediately after a palpated contraction for at least 1 minute, repeated at least once every 5 minutes.

Assessment of a baby's heart rate is an important cue that clinicians rely on to inform their judgement about the wellbeing of a baby during labour. In a midwifery unit, it will support a midwife's risk assessment of a pregnant woman and decisions about whether it is safe for them to continue receiving care there or whether they need to be transferred to an obstetric unit. Assessing a baby's heart rate is therefore of particular importance (see Theme 2).

## Assessment of risk

The information gathered at the start of a woman's pregnancy will determine whether their care will be recommended to be either:

- midwife-led (suitable for those who are healthy and assessed as having a low chance of complications during pregnancy and labour)
- obstetric-led (suitable for those planning an epidural for labour, those with health concerns and/or assessed as being at high risk of complications).

Women may choose to plan care differently from the recommended place of birth.

The level of risk for a pregnant woman may change at any time during their pregnancy, labour and birth, making risk assessment 'a continual process' (NICE, 2022b). A previous national learning report from HSIB in 2023 highlighted the need for individualised, ongoing, thorough assessment of risk throughout pregnancy and labour in any birth setting. This echoes findings in other national reports, for example the Ockenden report, (2022).

Multiple sources of information inform the holistic risk assessment of a pregnant woman. These include:

- clinical records
- results of medical tests and scans
- measurements of physical signs
- telephone or in-person conversations between clinical staff and the pregnant woman
- the symptoms a pregnant woman is experiencing
- the pregnant woman's preferences around place of birth.

Put together, these different pieces of information provide cues to midwives and other clinicians about the health and wellbeing of the pregnant woman and their baby.

The ability of clinicians to recognise and identify cues that indicate significant and cumulative risks to the wellbeing of the pregnant woman, or their baby, depends on the quality of the tools available to them. Furthermore, a clinician's ability to interpret the information will depend on their knowledge and expertise. There may be further influence from the environment in which care is being provided.

Continuity of carer is an approach within maternity care describing consistency in the midwifery or clinical team providing care for a woman and their baby throughout the pregnancy, labour and postnatal period. Continuity of carer has been shown to improve clinical outcomes for both mothers and babies, as well as improving maternal satisfaction with care (Sandall et al. 2016).

The reliability, timing and presentation of information may also affect a clinician's ability to assess risk in any given situation or birth setting, and their ability to make judgements and decisions about a pregnant woman. The judgements and decision making required in the context of midwifery units may be distributed across several healthcare settings. For example, information may be shared across community and hospital settings, which can create challenges relating to the availability of information and uncertainty about whether information is reliable and comprehensive.

Put together, these issues regarding the reliability of tools, availability of information and distributed decision making mean the assessment of risk is complex. In addition, variability in the quality of information (documented or communicated), the working environment, staff and conflicting goals may all influence decision making (Zsambok and Klein, 1997).

# Themes from the thematic analysis of maternity investigation reports

HSIB recognises the importance of choice of place of birth for women. The focus of this report is not to compare outcomes in one birthing environment with another; nor is it intended to influence a change in the choice of birthplaces available to women. Instead, the intention is to share the thematic learning identified through analysis of completed investigation reports, to be used alongside clinical guidance by staff working in and leading maternity services.

HSIB wishes to highlight that this thematic review included only births that had met the criteria for investigation by HSIB under these Directions.

This section presents the results of a thematic analysis (a process to look for common themes) of 92 maternity investigation reports carried out by the former Healthcare Safety Investigation Branch (HSIB). All the investigations involved pregnant women who received care in a midwifery unit.

The criteria used to select the 92 investigation reports, and the methods used to analyse them, are described in Appendix B.

HSIB also spoke with stakeholders in relevant healthcare organisations to inform the analysis and findings in this report.

The analysis found 4 main themes that represented factors affecting the delivery of safe care in midwifery units:

- Work demands and capacity to respond.
- Reliability and sensitivity of intermittent auscultation.
- Organisational preparedness for predictable safety-critical scenarios.
- Telephone triage.

These themes are illustrated by excerpts from the investigation reports. For each theme, there is also a set of safety prompts. The aim of the prompts is to promote and support learning discussions within midwifery units and other birth settings, and to influence the development of systems and processes to improve safety.

# Theme 1: Work demands and capacity to respond

The capacity issues from this thematic analysis related to the provision of sufficient staffing and appropriate physical space. Where work demands exceeded capacity was identified as a factor in 40 (43%) of the maternity investigation reports. This often resulted in delays in monitoring pregnant women and their babies or meeting other care needs. The following excerpts are typical examples from different reports and demonstrate the impact on the delivery of care.

> *"From the time of established labour at 23:15 hours, to the birth of baby at 05:52 hours, the baby's heart was auscultated on 20 separate occasions. On 15 occasions auscultations were completed outside of the 15 minute window … Between 02:54 hours and 03:36 hours there was an unrelated obstetric emergency occurring on the midwifery unit which required the attendance of the clinician who had to leave the woman unattended …"*

> *"The mother's care was handed over to a second member of the midwifery unit team ... The clinician who took over was also caring for a high-risk postnatal mother on delivery suite. The [staff] allocation across two birth settings was not safe … The woman did not experience continuity of carer in the midwifery unit. The woman was cared for by five members of the team in largely independent interactions until it was evident that the baby had died."*

> *"The staff were providing care [by] facilitating the woman's wish for a pool birth, gathering equipment, filling the birthing pool and completing documentation … Due to this it is likely that the baby's heart rate was not auscultated for over 35 minutes ..."*

The reports showed that midwifery units are affected not only by their own workload and capacity challenges, but also by those of hospital obstetric units and ambulance trusts.

The impact of capacity challenges in obstetric units was that pregnant women were directed to midwifery units for care or remained under the care of a midwifery unit and local and national guidance was not followed. For example, this would happen even where pregnant women were not, or were no longer, assessed as having a low chance of complications and where they needed care additional to that which the midwifery unit could provide. This impact was seen in 11 of the 40 reports (27.5%), where workload challenges affected the delivery of safe care.

> *"The investigation learnt that the midwife was feeling pressure to transfer the woman to a safe environment for the birth of the baby. They knew the labour ward was busy and a room was available on the midwifery unit … They knew that the woman was in advanced labour, and they assumed she would birth quickly and wanted to ensure the woman was safe … the maternal tachycardia [raised heart rate] seen on the CTG [heart rate monitoring equipment] meant that the woman was no longer low risk and was not suitable for midwifery led [labour] care on a midwifery unit … the midwifery team had multiple tasks to perform with competing priorities ..."*

> *"The woman was admitted to the midwifery unit with reduced fetal movements. This is not in line with Trust guidance. The HSIB investigation team found that this has become custom and practice to reduce workload within [the hospital] triage."*

In the ambulance service, the result of capacity pressures was a delay in ambulances arriving at freestanding midwifery units and a consequent delay in transfer to an obstetric unit for care:

> *"The ambulance service IT system searched for an available unit (ambulance crew in a vehicle) to send to the emergency, there was no unit available … At the time of the obstetric emergency ambulance services were experiencing high volumes of calls [and] the ambulance trust was experiencing an acute staff shortfall …"*

There were also examples where workload and staffing levels resulted in midwifery units being closed due to staff shortages:

> *"The family described the decision to close the local midwifery unit on the evening of the baby's birth as difficult to understand. The family was not aware that their choice of place of birth may be affected by staffing and workload pressures either before labour or when the mother was invited into the midwifery unit for assessment …"*

Overall, the reports reflected the challenge created by fluctuating work demands in maternity care. This results in a constant tension between the provision of sufficient capacity to ensure safety and the need for efficiency.

It is well recognised in safety literature that when work demands outstrip available resources, staff adapt what they do, and/or how they do it, to try to meet the demands. This attempt to balance demands against resources has been described as a trade-off between efficiency and thoroughness. In essence, it is the choice people (midwifery unit staff for the purposes of this report) make between being effective and being thorough “since it is rarely possible to be both at the same time” (Hollnagel, 2016). In healthcare, this trade-off can contribute to patient harm. This review of midwifery units found that the mismatch between demand and capacity frequently led to delays in care and/or safety-critical monitoring tasks during labour.

Guidance from NICE (2015) recommends staffing levels during labour and birth to be one midwife for each woman in labour. It is common for midwifery units to be staffed by one or two midwives and a maternity support worker. Support workers work under the supervision of a registered midwife. NHS Health Careers describes them as providing care such as helping with hygiene needs, carrying out routine observations (such as temperature, pulse, blood pressure) for a pregnant woman and promoting breastfeeding.

NICE guidance (2015) details the many tasks to be performed by staff while a pregnant woman is in labour. These include:

- monitoring a baby’s heart rate (see Theme 2)
- providing emotional support
- vaginal examination
- carrying out observations such as heart rate, temperature, and pulse
- documentation in clinical notes/charts
- communicating with, and supporting, birthing partners/family members
- assessing any vaginal blood loss
- preparing birthing pools as needed
- assessing pain and providing pain relief
- abdominal examinations (to help assess the position of a baby).

If assessment or monitoring results are outside of normal parameters, the number of tasks will increase, and additional monitoring and communication will be needed, or the woman may need to be transferred to an obstetric unit. As well as undertaking these tasks, the midwife may also be supporting their colleagues providing care for other pregnant women.

Staffing levels have been repeatedly highlighted as influencing the safety and quality of care provided within maternity units (Healthcare Safety Investigation Branch, 2020; Liberati et al, 2020; Ockenden, 2022). National guidance states that midwifery staffing should allow for the “ability to deal with fluctuations in demand (such as

planned and unplanned admissions and transfers, and daily variations in midwifery requirements for [labour] care)" (NICE, 2015).

Birthrate Plus® is the workforce planning tool most widely used to determine the number of staff (and ratio of midwives to support workers) required by a maternity service – often referred to as the 'workforce establishment'. Maternity services are not required to use Birthrate Plus® and can opt to use an alternative.

Stakeholders raised a number of issues regarding Birthrate Plus® during interviews. In essence, these related to the fact that there has been little external scrutiny and published empirical evidence to confidently determine the reliability and validity of the tool. The need for evidence was highlighted by the National Institute for Health and Care Excellence (2015) in its guideline on midwifery staffing, which stated that "the effectiveness and cost effectiveness of Birthrate Plus® is unknown". The guideline recommended research to establish whether "other toolkits or methods for determining staffing requirements are better (or worse) than Birthrate Plus". The issue was picked up again by the Ockenden report (2022), which recommended that the feasibility and accuracy of Birthrate Plus® and its associated methodology be reviewed nationally by all relevant bodies, including the Royal College of Midwives, Royal College of Obstetricians and Gynaecologists and NHS England.

HSIB understands that NHS England's maternity team continues to review this area.

In addition to recommending a review of Birthrate Plus®, the Ockenden report stated that there was an "urgent need for a robust and funded maternity-wide workforce plan" to deliver safe maternity care. Since then, NHS England has published the NHS Long Term Workforce Plan (June 2023), which aims to train, retain and reform the workforce.

Since 2021 the Government has invested an additional £165m a year to improve maternity and neonatal care, rising to an additional £186m a year from April 2024. The number of midwives has increased by 21.5% since 2010 and by 5.8% in the past year. Funding for an additional 160 new posts over 3 years aims to increase the number of midwives and support the continued growth of the maternity and neonatal workforce.

Experiences shared in this thematic analysis provide further evidence of the need to address midwifery staffing. In addition, and although outside the scope of this review, HSIB acknowledges that staffing challenges, and a mismatch between work demands and capacity, are likely to have a negative impact on staff wellbeing. Attention to staff wellbeing has been identified as a contributor to the safety of maternity units (Liberati and others, 2020).

### Safety prompts

- How do you assess whether you have the right staff (numbers, skills, and experience) in your midwifery unit? Do you know the evidence base for the tools you use to assess staffing?
- How do the results of your staffing assessment compare with the perceptions of:
  - those working in the unit
  - feedback from pregnant women birthing in the unit
  - any patient safety incidents?
- Do you regularly share information on staffing in your unit – and any concerns about staffing – with the:
  - trust's board
  - maternity safety leads
  - local integrated care board
  - midwifery networks
  - local maternity and neonatal voice partnership?
- How are staff supported to escalate when demand exceeds capacity?

## Theme 2: Fetal monitoring in a midwifery unit

There are several different ways to monitor a baby's heart rate during labour. This report does not compare the different methods of fetal monitoring. Some of the findings here may also be applicable to other methods of fetal monitoring.

Intermittent auscultation or 'listening in', is the recommended method of a listening to a baby's heart rate in labour, in pregnancies where there are no anticipated complications.

It is usually the method used when care is being provided in a midwifery unit and is part of a dynamic assessment of a mother and baby's wellbeing throughout labour.

A confidential inquiry into 64 intrapartum-related deaths of babies born in midwifery units (Rowe et al, 2020) found that IA was used to monitor the baby's heart rate in the majority (72%) of these cases. Issues with IA were identified in over half of the deaths of babies reviewed by the inquiry, and in nearly a third of the deaths this was considered to be "probably or almost certainly relevant to the outcome for the baby". Issues included:

- the timing of IA
- poor, inadequate, or confusing recording of IA or the baby's heart rate
- errors in interpretation
- a failure or delay in recognising or acting on concerns with the baby's heart rate.

Similar problems with IA have been identified in other reports (Royal College of Obstetricians and Gynaecologists, 2020; 2017).

Difficulties with carrying out or interpreting the results of IA were a factor in 45 (49%) of the 92 investigation reports in the thematic analysis. This indicates that, in practice, there are challenges with IA that mean it may not always be a reliable or sensitive tool. The following excerpts are typical of the issues found in the reports.

> *"Prior to delivery, there was difficulty in auscultating the fetal heart rate and it was thought that this was because the Baby was descending through the birth canal."*

> *"Staff told the HSIB investigation team that in relation to documenting the baby's heartbeat, 'everyone does it differently'".*

> *"[The investigation team] considers that there were likely to have been abnormalities in the Baby's heart rate which were ongoing for a prolonged period of time, which were not identified during IA."*

IA requires a midwife to count the number of heartbeats heard over 1 minute and record it as a single number. As well as recording the heartbeats, national guidance from NICE (2022) states that a pregnant woman's pulse should be palpated (felt by hand) at the same time to differentiate it from the baby's heartbeat at least hourly during the established first stage of labour, and with every occasion of IA during the confirmed second stage of labour. This is important because, depending on the position of the baby, Pinard and Doppler devices can also produce sound from the pregnant woman's heart, so it is possible to confuse the pregnant woman's heartbeat with their baby's. This issue is not unique to IA and can occur during other methods of monitoring of a baby's heart rate.

Midwives working in a midwifery unit setting rely on IA to inform their judgement about the wellbeing of a baby and this contributes to their holistic assessment of whether a pregnant woman needs to be transferred to an obstetric unit during labour.

National guidance (NHS 2023) identifies minimum standards for staff who undertake fetal monitoring in a core competency document. Training is required to be tailored for specific groups, for example home birth or birth centre teams.

A systematic scoping review undertaken in 2019 sought to establish the evidence for IA and its accuracy. This found there was variation in technique, and sometimes difficulties in recognising changes in a baby's heart rate that deviated from an expected pattern. The research concluded that the best way to carry out IA (in terms of frequency, duration and method) remains unproven.

The review found there was a limited evidence base underpinning IA. Midwives' views on IA have been explored, showing they experienced it to be a challenging task. They felt confused by the baby's heartbeat at times, and gave varying counts for the baseline heart rate when asked to listen to the same audio output of a baby's heartbeat (Harding et al, 2020; Mdoe et al, 2018). The range in the figures was significant and the studies concluded that there was inaccuracy in practice. This research brings into question whether it is always possible to identify signs of concern using IA. These findings, and those from the other research and enquiry mentioned above, reflect the findings from the thematic analysis of maternity investigation reports.

Harding et al (2020) concluded from their research that additional training for IA was needed and that the method of calculating a baby's heart rate should change. Rather than counting for a minute, they proposed counting in 15 second bursts over 90 seconds, and then adding up the most similar 4 numbers to get the baby's heart rate.

It is well recognised in safety literature that there is often a difference between the way tasks are set out in guidelines and policies, and how staff actually do them in practice (Shorrock, 2016). As mentioned, this frequently involves workers adapting what they do and trading off thoroughness for efficiency. Based on the literature and evidence from HSIB maternity investigations (in both midwifery and obstetric units), midwives use the following methods when carrying out IA to determine a baby's heart rate (number of heartbeats per minute (bpm)):

- count the heartbeat for 15 seconds and then multiply by 4
- count the heartbeat for 60 seconds (this is in line with current national guidance)
- count the heartbeat for 30 seconds then multiply by 2
- do not count the heartbeat and document one of the numbers that show on the Doppler during IA
- listen for 90 seconds and count the heartbeat in 6 x 15 second bursts, commit these to memory then add up the most similar 4 numbers to get the heartbeats per minute.

A baby's heart rate may temporarily accelerate and decelerate. Listening and counting for different lengths of time (15, 30 or 60 seconds) will, therefore, potentially establish a different baseline heart rate. If the accuracy of the baseline is poor, decisions about a pregnant woman's care will potentially be based on inaccurate information.

The investigation reports included in the thematic analysis provided further evidence of the already known safety concerns with IA. Typically, a baby's heart rate was not auscultated as described in guidance, or not auscultated as frequently. Importantly, this finding was often associated with a high workload. Taken together, these findings indicate that IA as described in guidance may be difficult to achieve in practice. There were also instances where IA was described as being carried out in line with national guidance, but the deteriorating health of the baby was not detected.

In addition to IA not being carried out in line with guidance, the thematic analysis identified the nationally recognised risk of mistaking a pregnant woman's heart rate for their baby's. This was found to be a contributory factor to the poor health outcomes for some of the babies in this analysis. Difficulty differentiating between a pregnant woman's heart rate and their baby's has been highlighted in previous national learning reports from HSIB.

The reports included in the thematic analysis contained no evidence that the maternity investigations considered factors that may contribute to IA being a challenging task. It is not known whether investigators explored these factors during the investigations. An appreciation of such factors may help to explain the difference between IA as set out in policy and IA as it is carried out in practice. While a detailed discussion of all the possible factors is beyond the remit of this report, some are briefly outlined in the following content.

## Physical constraints

The task of palpating a pregnant woman's pulse at the same time as listening to their baby's heart rate with a Doppler device or Pinard stethoscope can be both challenging and physically demanding given the different positions a woman may adopt during labour. The Doppler device may need to be placed on the floor, bed or table to free up a midwife's hand to do both at the same time.

## Noise

IA requires a midwife (or other clinician if using in a different setting) to listen to the sound generated by the Doppler device or Pinard stethoscope to assess a baby's heart rate. However, there are often many other competing sounds within the environment – for example, noise from the pregnant woman, music, colleagues speaking, questions from a birthing partner or family member and so on.

Research has found high noise levels of more than 93 decibels on hospital labour wards (Jensen et al, 2019). To put that into context, a vacuum cleaner is equivalent to 50 decibels (Konkani and Oakley, 2012). The researchers found that teams dealing with emergency scenarios in birthing rooms with a high noise level did not perform as well as teams working in birthing rooms with lower noise levels (Jensen et al, 2019). The researchers concluded that noise in birthing rooms is a significant cause of impaired clinical performance. While the absence of more electronic equipment (and the associated beeps and sounds they make) may mean midwifery units are quieter than obstetric units, it is possible that noise levels may still be high enough to influence performance.

## Attention and vigilance

Attention can be defined as giving 'mental resources to processing' (Lavie et al, 2014). In certain circumstances, people can have a limited capacity for attention and other cognitive processes such as awareness and memory. IA demands paying attention to, and processing, information from multiple sources:

- **visual** – looking at the pregnant woman's abdomen, watching the time and any information displayed by the device
- **auditory** – listening to the baby's heart rate and ignoring distracting noises
- **tactile** – feeling the pregnant woman's abdomen to assess whether a contraction has stopped, positioning the Doppler device, and feeling the woman's pulse.

At the same time, the midwife (or other clinician) is counting the heartbeats, identifying any changes from the previous heart rate, and, if any changes are detected, making a decision about their significance. IA is, therefore, a cognitively demanding task which is challenging to do consistently and is vulnerable to error.

Vigilance can be defined as the ability to sustain concentrated attention to a task over a prolonged period, typically to identify possible danger signs or difficulties (Eysenck et al, 2015). Ballard (1996) reviewed the results of research studies to identify the factors that affect people's ability to maintain vigilance. These include:

- the length of time vigilance is required – the longer it is required, the more difficult it is to maintain
- the subtleness of the danger signs or difficulties being looked for – the more subtle the signs, the more risk there is of missing them
- the frequency of the signs being detected – the less frequent they are, the more risk there is of them being missed
- distractions – the more distractions there are, the more difficult it is to maintain vigilance
- alertness – the less alert a person feels, the more difficult it is to maintain vigilance.

IA requires a midwife to remain vigilant about a baby's heart rate over the course of typically a 12-hour shift, to detect subtle changes and to consider these findings in the context of the woman's clinical situation. This vigilance is frequently required in the context of a busy, noisy environment with competing distractions and many additional tasks. If the shift is at night, there are added risks to vigilance because the midwife is working against the natural sleep/wake cycle (Craig et al, 2012). There are, therefore, multiple threats to a midwife's ability to remain vigilant.

Given their potential influence on the way IA is carried out, it may be beneficial for maternity safety investigations to explore these factors when IA contributed to the incident.

A report published by HSIB in 2021 considered the reliability of tools – including IA – relied on for the evaluation of a baby's wellbeing. The report recommended that the Department of Health and Social Care (DHSC) commission "a review to improve the reliability of existing assessment tools for fetal (baby) growth and fetal heart rate to minimise the risk for babies". In essence, the intention of the safety recommendation was for a review to consider both the reliability of the tools and the reliability of their use in the intended environment (maternity settings).

In response to this recommendation, the DHSC commissioned a review through the National Institute for Health and Care Research of the accuracy and clinical effectiveness of fetal growth monitoring strategies for the prediction of small for gestational age at birth. This work completed in October 2023 and the report will be published in due course.

Assessment tools for fetal heart rate will be assessed separately as part of a DHSC-funded national brain injury reduction programme. Improving intrapartum fetal surveillance is a core component of this. This also covers clinical tools and training approaches that are underpinned by an extensive systematic review. A pilot of the products is due to start in May 2024, and expected to conclude in January 2025. The pilot programme is expected to demonstrate improvements in intrapartum fetal surveillance, among other things. This will inform a national scale-up programme that DHSC has committed to fund with £9 million over 3 years following completion of the pilot.

A 3-year study is currently in progress called 'Listen2Baby', (National Perinatal Epidemiology Unit, 2023). This focuses on IA specifically and is therefore of particular relevance to this national learning report. The investigation interviewed the Chief Investigator of the study, who explained that the study was commissioned because of repeated investigations that identified IA not being carried out as intended in guidance, along with the lack of understanding about the reasons why. In addition, the study aims to fill the gap in current research about the best way to do IA in practice, including the best device or counting method to use. The Chief Investigator outlined the study's 5 work packages, which include:

- a survey to get a national picture of how IA is currently carried out (for example, devices used, counting methods, training packages, audit)
- watching midwives using IA in different units across the UK and talking to them about what it is like to carry out from their point of view
- speaking to pregnant women and their partners about their experiences of having their baby's heart rate monitored using IA
- working with midwives, pregnant women and other experts to design a practical toolkit to improve the practice of IA
- testing the feasibility and acceptability of the toolkit.

The study is due to finish in 2025. If the toolkit that is developed is found to be feasible and acceptable, the intention would be to adopt it nationally and assess competency against it.

## Safety prompts

- Do the midwives in your unit receive training on intermittent auscultation as part of fetal monitoring training at least once a year? How do you assess their competency? How do you explore whether staff feel confident and competent in intermittent auscultation?
- Do you know the extent to which midwives are able to comply with national guidance on intermittent auscultation monitoring (for example, by regular audit)?
- Do you explore and understand the reasons for any gap identified between guidance and the work carried out? Are these reasons reflected in your own investigation reports involving intermittent auscultation?
- Is a buddy system used in your unit to support midwives to objectively assess suitability to continue with intermittent auscultation at least every four hours?

## Safety observation:

- Maternity safety investigations can improve patient safety by considering factors known to influence the effectiveness of intermittent auscultation such as noise, physical constraints, and the ability of staff to maintain vigilance.

# Theme 3: Organisational preparedness for predictable safety-critical scenarios

Organisational preparedness refers to an organisation's readiness for, and ability to respond effectively to, situations or events. In relation to safety-critical scenarios, it requires an ongoing process of actively planning (as an organisation and as a team) for such events or situations to develop responses and measures to reduce identified risks to safety. Organisational preparedness can be seen as part of a broader group of activities designed to identify and reduce risks to safety, and to create resilience (capability to ensure things always go right).

The thematic analysis identified a need to improve organisational preparedness for predictable safety critical scenarios. Of the investigation reports in the analysis, 40 (43%) were about predictable safety-critical scenarios and described circumstances where work systems and processes had not functioned as intended and had hindered the response of staff. For example, in both alongside and freestanding midwifery units, it is not uncommon for a pregnant woman, or their baby, to need urgent transfer to a hospital. The investigation reports included in the thematic analysis showed this process often did not go smoothly, resulting in a delay in care or treatment.

> *"Next to the telephone … is a table summarising the various [emergency] calls that may be required including the specific wording to be used. There are a total of eight possible calls … The staff member at the desk where the phone was situated worked in the [alongside midwifery unit] infrequently, it fell to them to make the emergency call. When the call was made [the details given were] not the same as the staff who had identified the emergency had requested. This caused confusion … The neonatal team went to the delivery suite as the emergency call had requested … [but] were sent away ... as the mother had yet to arrive and staff were unaware that [the woman] was on her way."*

> *"… the labour ward co-ordinator was unaware of the woman's transfer until … after the woman had arrived on the labour ward … [it had] become accepted practice … to move mothers to the labour ward and inform the co-ordinator afterwards."*

> *"The 999 emergency call lasted for 10 minutes before an ambulance was despatched … due to communication challenges during the call … The staff member had to leave the telephone to attend the clinical area to obtain clinical information [from the clinicians performing resuscitation] to assist the call handler [in deciding which ambulance and paramedic crew to dispatch]."*

National reports have highlighted problems with the process of transfer, confirming the need for greater organisational preparedness for this situation (Ockenden, 2022; Rowe et al, 2020).

Another predictable safety-critical scenario in a midwifery unit is that a baby may be born unwell and need resuscitation. The investigation reports provided examples where the environment and/or access to equipment, as well as inadequate training and preparation, hindered the ability of staff to respond effectively in this emergency situation.

> *"When they went to get the resuscitaire [a cot-like medical device which provides a warming platform along with additional equipment needed for resuscitation] there were other pieces of equipment that had been placed in front of it obstructing the ease of access. When the resuscitaire was brought into the delivery room, staff found it difficult to connect the plug and oxygen due to the furniture and other objects in the room."*

> *"… this was the first time that some staff members had been involved in a complex neonatal resuscitation. They were working in an unfamiliar … cramped environment and locating equipment when it was not immediately to hand."*

> *"There is no emergency call bell in the delivery rooms on the midwifery unit to summon help from staff on the delivery suite. This led to the midwife taking the unresponsive baby with them to use the emergency call bell causing a delay in escalation for assistance and … resuscitation."*

Organisational preparedness – and resilience – is particularly important for healthcare organisations, which are buffeted by combinations of usual and unusual demands. Typically, these include variations in staffing and other resources, peaks in workload, information losses, incessant change and many or conflicting goals.

Another aspect of health care that makes organisational preparedness especially necessary is the complex nature of clinical work. Dealing with this complexity requires high levels of discretion and professional judgement, and the need for people to be flexible and adaptable. As a result, "it is impossible precisely to prescribe or even describe how work should be done" (Hollnagel et al, 2015). Guidelines, policies and procedures are not, therefore, by themselves sufficient to ensure safety. Furthermore, the ability of staff to implement and adhere to guidance/policies is influenced by the clinical and workplace context and demands placed on healthcare systems (Vincent and Amalberti, 2016).

The excerpts from the investigation reports used in the thematic analysis demonstrate the need for training and rehearsal of predictable critical situations to 'stress test' existing systems and processes to see whether they work as intended in these scenarios. Along with the testing of systems and processes, rehearsals test how well teams work together and can help prepare staff to respond competently and confidently in emergency situations. Other national reports have highlighted the importance of such training and the need for it to be multidisciplinary and involve all those involved in the delivery of care in such emergency scenarios (National Maternity Review, 2016; Ockenden, 2022; Royal College of Obstetricians and Gynaecologists, 2020).

In situ simulation (the simulation of scenarios in the workplace) provides practical rehearsal of safety-critical scenarios. It is a way of understanding how existing work systems and processes may work in such situations, and what may hinder staff responding in line with guidance and as needed to enhance safety. A study of in situ simulation in a 'very safe' maternity unit found that it "fostered and constantly reinforced" mechanisms that contributed to safety (Liberati et al, 2019). Building on this study, Liberati et al (2020) concluded that in situ simulation allowed staff to "observe how systems and processes operate in realistic conditions and to test the usability and appropriateness of equipment and other resources needed for care".

In their study of in situ simulation in a maternity unit, Macrae and Draycott (2019) discussed 3 elements that make it a potentially powerful tool through which resilience – and safety – can be enhanced:

- **Relational rehearsal** – this refers to the social processes involved in in situ simulation. That is, the coming together of diverse professionals to collectively work together to respond to an emergency scenario. This provides an opportunity to strengthen social and professional bonds, build shared expectations, and create collective trust.
- **System structuring** – this refers to the processes involved in testing and improving the organisational systems that support the management of emergencies. In situ simulation was found to provide "a space in which deficiencies in current work systems and organisational arrangements can be identified and addressed".
- **Practice elaboration** – this refers to the processes involved in examining and improving clinical practices to promote timely and effective responses to emergency scenarios. In situ simulation was seen as creating a space to observe and reflect on practical work, and the systems surrounding it, to identify refinements and improvements.

In other safety-critical industries (such as aviation and rail) simulation is a tool used within existing safety management systems to identify safety risks and to consider modifications to work processes and environments.

The investigation reports included in the thematic analysis show the dependency on, and impact of, other services and areas on the delivery of safe care in midwifery units, for example the ambulance service and obstetric units. In situ simulation in midwifery units could usefully draw on real safety-critical incidents and would need to include staff from all the areas/services involved to maximise learning and potential safety gains. There was evidence in the investigation reports that, currently, training does not always include staff outside the midwifery unit who would be involved in an actual emergency situation. The review was made aware that operational pressures may affect the availability of staff for training, and that that training attendance sometimes occurred outside of scheduled working hours.

> *"Staff also described that, within the standalone birth unit, emergency drills are undertaken involving the midwifery unit staff only and no members of the multi-disciplinary team in the wider hospital are invited to attend."*

> *"When an emergency occurs in the [alongside] midwifery unit, staff activate an emergency bell to alert hospital staff for their assistance. It was commented on by the hospital staff during interview that they were not familiar with the layout of the midwifery unit, including where resuscitation equipment was kept."*

In situ simulation requires time and resource, making it challenging for many organisations to implement. There are other methods and tools, apart from in situ simulation, that can be used to prospectively assess risk (identify potential risks that could cause harm). The investigation reports in the thematic analysis demonstrated how aspects of the work system impeded the ability of staff to deliver safe care. However, there was no clear evidence of a process of ongoing prospective risk assessment.

One of the 'essential actions' included in the Ockenden report (2022) was that midwifery units "must complete yearly operational risk assessments". Similarly, a previous HSIB maternity national learning report recommended that a framework, or tool, needed to be developed to help trusts anticipate operational risks (problems or threats to safety in the delivery of care) in relation to neonatal resuscitation. The evidence from the investigation reports in this thematic analysis suggest a similar framework is needed for all safety-critical scenarios in midwifery units. Transfer to hospital settings and summoning urgent assistance are 2 important, predictable, situations to consider. In situ simulation may usefully inform any such risk assessment.

During consultation with national bodies and clinical leads about potential safety recommendations, HSIB was told about a pilot project in NHS England's North East and Yorkshire region. The project involved 5 freestanding and 8 alongside midwifery units within the region assessing themselves against the evidence-based European Midwifery Unit Standards. The standards were agreed by the Midwifery Unit Network and European Midwives Association in 2018 and updated in 2020. They were developed to provide practical guidance on what midwifery units are, what care they provide and 'what the characteristics of well-functioning midwifery units are'.

Development of the standards was funded by a number of bodies including the National Institute for Health and Care Research and the Royal College of Midwives. More than 100 stakeholders contributed to creating the standards, which also included a thorough process of systematic review of the literature and gathering consensus form experts in the field. At the time of publishing, the investigation was made aware that this endorsement is currently under review due to a change in the underpinning guidance. In 2019, the National Institute for Health and Care Excellence (NICE) endorsed the 29 standards across 10 themes. The themes include:

- environment and facilities
- knowledge, skills and training
- women's pathways of care
- working across professional boundaries
- staffing and workload.

The standards and associated self-assessment questions address the themes found in this thematic analysis. For example, the standards cover:

- staffing – essential staffing to include a core staff team and midwifery leadership on site
- assessment of workload – taking into account all activities undertaken in the midwifery unit
- training on intermittent auscultation – at least once a year
- policy and procedures for transfer – to include agreements with local ambulance services for freestanding centres
- a linked lead midwife, obstetrician and neonatologist (specialist in the care of newborn babies) – to be involved in co-producing operational policies and guidelines
- shared written commitment to mutual respect and working across professional and physical boundaries across the whole maternity service

- a written, agreed list of knowledge and skills needed for midwives to work in the midwifery unit – including facilitating transfers, responding effectively to obstetric emergencies and neonatal resuscitation
- interdisciplinary training days – which include midwives, maternity support workers and staff from the ambulance service, obstetric and neonatology teams, with some training days located in the midwifery unit
- orientation in the midwifery unit – for all maternity care professionals so they can become familiar with the environment, equipment and staff
- physical environment – designed to support the philosophy of care but which includes neonatal resuscitation equipment in each room or portable resuscitaires outside the room in readiness for emergency situations.

In effect, self-assessment against the standards provides a prospective risk assessment.

Midwifery units within the region have used the results of their self-assessment to develop an improvement plan for their units. The project team has reviewed the results across the whole region to identify commonalities and where support can be provided. This includes providing resources that teams can use, for example a training needs analysis for midwives working in midwifery units and setting up a forum for all the midwifery unit lead midwives involved in the project. The regional lead obstetrician and the regional chief midwife both join to discuss issues and problem solving and work with senior leaders within their organisations to help resolve problems or celebrate and share good practice.

HSIB spoke with the project team about the findings from this thematic analysis and the potential role of in situ simulation. In particular, in situ simulation was discussed for testing work processes and the availability and useability of equipment for safety-critical scenarios such as transfer of a pregnant woman and resuscitation of a newborn baby.

The project team explained that the standards and self-assessment tool are intended to be used in Europe as well as the UK, so need to be flexible so that they can be used in a variety of contexts. Simulation or skills & drills are recommended, and each unit/country should decide flexibly how to embed them in their in-service training.

However, the project team said that in situ simulation was happening at some of the participating midwifery units, partly in response to recommendations in the Ockenden report (2022) and/or initiated by proactive midwifery unit leads. In addition, the project team advised that it was developing some regional principles for transfer and escalation and anticipated that in situ simulation would be included. Reflecting findings from this thematic analysis, the project team said feedback from the freestanding midwifery units had highlighted the importance of including paramedics from the ambulance service in in situ training.

The gap analysis achieved through this pilot project has provided organisations the opportunity to benchmark against best practice safety and quality standards for midwifery units, to identify gaps for improvement. This has led to changes in strengthening of leadership, improvements in estate, updating of guidelines, obstetric and neonatal support, improvements to training and learning.

### Safety prompts

- How do you prepare staff in your unit and test existing systems and processes for predictable safety-critical scenarios? For example, transferring a pregnant woman to an obstetric unit or resuscitating a baby born in poor health.
- Have you jointly developed standardised ways to communicate levels of urgency in relation to transfer with ambulance services and receiving obstetric units?
- Are relevant staff from other areas (such as the local obstetric unit and ambulance service) involved in developing your transfer procedures and pathway?
- Do birth planning discussions with pregnant women include the transfer arrangements and estimated time for transfer between the midwifery unit and obstetric unit?
- Where is the neonatal resuscitation equipment located for each room? Is it easily accessible and kept ready for use at all times?
- Do you prepare staff for predictable safety-critical scenarios by rehearsing through in situ simulation? If so, do you include all staff from relevant services such as the obstetric unit and the ambulance service for freestanding units?
- Do you carry out operational risk assessments every year? If so, do you use a structured framework or self-assessment tool such as the Midwifery Unit Standards developed by the Midwifery Unit Network and European Midwives Association?

## HSIB makes the following safety observations

### Safety observation:

Midwifery units can improve patient safety by assessing themselves against the Midwifery Unit Standards to provide a prospective risk assessment and inform any necessary improvement plans.

**Safety observation:**

In situ simulation can improve patient safety by bringing together multidisciplinary and multi-agency teams to enhance organisational preparedness and support prospective risk assessment.

## Theme 4: Telephone triage

When a mother suspects labour is starting or if they have other concerns, they would usually contact a telephone number provided to them. This service may be provided by staff working in a midwifery unit for mothers planning birth there, or by a central triage service. The review did not compare the service provided in different locations.

NICE guidance is to encourage pregnant women to telephone for advice in the first instance when labour begins, or if they have concerns, rather than visit a midwifery unit or hospital obstetric unit in person. This is referred to as telephone triage.

The purpose of telephone triage is to enable midwives (and any other staff involved) to reliably capture and interpret information about the pregnant woman's condition and the wellbeing of their baby. This results in a decision about the urgency of a pregnant woman's need for care and the nature of the care required.

The number of triage calls made by a pregnant woman during their pregnancy will vary. A high number of calls may reflect the level of their concern or indicate the presence of more severe or persistent symptoms. A reliable system is needed to ensure all calls are logged so that triage staff can see how often a person has called, the assessment made, and advice given. NICE guidance (2023) requires clinical staff to document the advice they have provided in a triage context.

The thematic analysis showed that the documentation of information and effectiveness of communication during triage calls was variable. This was particularly evident if the pregnant woman had spoken to different members of staff, who were using different information systems (paper and electronic), in different geographical locations – for example, at both an obstetric unit and midwifery unit. Other issues found in the investigation reports included:

- the availability and accessibility of clinical information to support decision making
- difficulties with assessing risk over the telephone
- confusion for pregnant women when they had been given multiple telephone numbers.

Telephone triage was identified as a contributory factor in 13 (14%) of the maternity reports included in this analysis.

> *"Staff tend to provide mothers with the [telephone] numbers for midwifery unit and the labour ward throughout their pregnancy, especially if they have already been seen at one of the units. This leads to confusion and calls being made to various units … there is no consistency for where staff expect to receive calls and for what reasons."*

> *"… the woman arrived at the midwifery unit … and was found to be involuntarily pushing … staff attempted to listen to the Baby's heartbeat, which they were unable to hear … The HSIB investigation learned that there were no formal handovers between (the midwifery unit and hospital triage unit) with regards to calls made to each area … If there was a long period between calls then the call would reset as a first call. The Trust does not use an electronic record system and calls are logged on separate sheets in each area … this led to a loss of awareness of the number of previous calls that had been made …"*

> *"The Trust used several different documentation systems within the maternity unit. [Hospital] triage staff capture care on an electronic system, [midwifery unit] staff document care in handwritten notes initially, and input this onto the electronic system after the birth of a baby, in order to provide uninterrupted care … There was no opportunity for [midwifery unit] staff to review the [hospital] triage electronic system records … [and know] when the previous [assessment of the baby's heart rate was] … the trend of the baby's heart rate could not have been determined, nor times between IA."*

National guidance from NICE (2023) states that in the early phase of labour, before it has become established, it is best for pregnant women to stay at home. This is therefore the advice that will be given during telephone triage. Once assessed as likely to be in the established first stage of labour (characterised by regular contractions), or if concerns are identified from the information gathered, a pregnant woman is likely to be asked to come to the midwifery unit. This is so that monitoring can be carried out to assess the wellbeing of the woman and their baby.

Telephone triage is complicated by the fact that the way information is conveyed over the telephone may vary and will be influenced by the language used and style of communication. The way instructions are phrased and delivered is acknowledged

as a potential barrier to communication when the intention is to ensure that a specific action is completed (Flin, 2008). Additionally, in health care, the way information is received or understood will be influenced by the clinician's knowledge and experience of the subject in that clinical environment. There may be further communication challenges for both clinicians and pregnant women if English is not their first language. In the context of stressful situations and demanding work environments, strategies for effective communication between pregnant women (or their partners) and staff need to minimise all barriers, to help staff make reliable decisions and take action within limited timeframes.

The investigation reports included in the thematic analysis demonstrate that telephone triage is an important safety activity. It provides an opportunity to recognise significant cues, and make critical judgements and decisions, which may affect subsequent actions and outcomes. Any loss of information at this stage, or potential for misunderstanding, may prevent staff from identifying signals that may indicate emerging problems with a pregnant woman or their baby. These symptoms and signs may be subtle, so effort is required to ensure they are not missed.

Previous HSIB maternity national learning reports have identified the critical importance of telephone triage in identifying and assessing. One of the key themes from the 2023 HSIB report on assessment of risk during the maternity pathway was the need for telephone triage services to be operated by appropriately trained and competent clinicians who are skilled in the specific needs required for effective triage. The 2021b HSIB national learning report on intrapartum stillbirth during the COVID-19 pandemic recommended that NHS England and NHS Improvement lead on "the development of minimum operating standards for pre-assessment maternity telephone triage services to support safe and consistent telephone triage to ensure reliable identification of risks". This thematic analysis has provided further evidence to support this safety recommendation.

HSIB spoke with an NHS England maternity clinical advisor about the progress of the safety recommendation. The clinical advisor said that the safety recommendation had been discussed with the Royal College of Obstetricians and Gynaecologists. The Royal College has recently published a Good Practice Paper, which includes a section relating to telephone triage.

## Safety prompts

- Do you have a standardised, structured process for providing telephone triage and the documentation of advice given? If so, has this been discussed and agreed with other relevant staff such as those providing telephone triage at the local obstetric unit?
- Can staff providing telephone triage easily access all relevant information systems?
- How do you gather feedback about the experiences of staff and pregnant women about telephone triage?

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# Appendix A: Reasons for transfer to a hospital setting and health outcomes

The maternity investigation reports included in the thematic analysis involved pregnant women and babies who required transfer from either a freestanding or an alongside midwifery unit to an obstetric or neonatal unit to receive additional care.

## Reasons for transfer from a freestanding midwifery unit

Of the 92 pregnant women, 15 were cared for in a freestanding midwifery unit.

Five pregnant women were transferred during labour for the following reasons:

- concerns about the baby's heart rate
- the need for pain relief
- meconium-stained liquor (meconium is a baby's first bowel motion (poo). It is usually passed after birth and can sometimes be found in the amniotic fluid ('waters') during birth. Passing meconium before birth can be a sign that a baby is unwell)
- the baby's heartbeat could not be heard when attempting to listen (stillborn).

Ten pregnant women were transferred after they had given birth as their babies needed additional specialist care.

## Reasons for transfer from an alongside midwifery unit

Of the 92 pregnant women, 77 were cared for in an alongside midwifery unit.

Fifty-five pregnant women were transferred during labour. The reasons for this included:

- concerns about the baby's heart rate
- the baby's heartbeat could not be heard when attempting to listen (stillborn)
- meconium-stained liquor
- the need for pain relief
- the position of the baby meant there was an increased risk of complications during birth

- vaginal bleeding
- slow or no progress of the active second stage of labour requiring additional care to support birth.

Twenty-two pregnant women were transferred after they had given birth as their babies needed additional specialist care.

## Health outcomes

The health outcomes of the 92 babies were as follows:

- 11 babies died within the first 6 days of their life
- 62 babies required therapeutic cooling for potential brain injury
- 19 babies died during labour and before birth.

# Appendix B: Thematic analysis methodology

## Inclusion criteria

The thematic analysis included HSIB maternity investigation reports with findings related to care provided in a midwifery unit (both free standing and alongside midwifery units were included, and not differentiated for the purpose of this review) if they met 2 criteria:

- they were completed on or before 14 June 2022
- the pregnant woman or their family, and the trust where the incident took place, had the opportunity to review the report and provide feedback.

A search identified 342 such reports from healthcare organisations across England.

A random sampling technique was used to select 160 reports for analysis. Of these, the analysis only included those reports where consent had been received to use the information for analysis and wider learning. The final sample consisted of 93 reports. After the analysis was completed, one report was withdrawn from inclusion in this national learning report at the request of the family.

## Approach

Data analysis software was used to interrogate the text within the reports. The thematic analysis used a framework to categorise and sort the report text (Ritchie et al, 2014). This enabled information referring to 'similar things' to be gathered, collated and reviewed to understand common themes across multiple reports. Coding, which is the process of labelling information in the text so that it can be sorted and grouped, was completed by 2 data analysts, one of whom also has expertise in maternity care and safety science.

The stages of the thematic analysis were:

- Initially, the categorisation captured 'what' events happened – that is, the nature of the incidents.
- At the next level, codes reflected the 'how' – that is, the relationship between the work structures and processes within the healthcare systems that influenced how care was delivered. The 'how' level of coding was informed by the Systems Engineering Initiative for Patient Safety (SEIPS) framework (Carayon et al, 2006; Holden et al, 2013). This framework specifies the work system components that can contribute to patient safety incidents – the components are: technology and tools, tasks, environment, organisation and people. SEIPS focuses on the nature

of the interactions between the components, showing how the design of the components and the interactions between them can influence outcomes in terms of safety and quality.

- An understanding of ‘why’ was informed by considering the ‘what’ and the ‘how’ in conjunction with consultation with national bodies and clinical leads. This aimed to establish why certain factors may have influenced the delivery of safe care and the outcome for the pregnant woman and/or their baby.

There are more examples of this approach in HSIB national learning reports on Never Events and intrapartum stillbirth during the COVID-19 pandemic.


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