Health Services Safety Investigations Body

Investigation report

Neonatal collapse alongside skin-to-skin contact

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Foreword by Unicef UK

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We welcome this report and the valuable insights it provides. While the incidence of sudden unexpected postnatal collapse (SUPC) is small, the impact for the families involved can be devastating and lifelong and so we must do everything we can to learn from this investigation.

Over the last 20 years a large body of evidence has built around the impact of skin-to-skin contact on infant and maternal health. It is now accepted that skin contact helps babies to adjust to life outside the womb and supports mothers to initiate breastfeeding and to develop a close and loving relationship with their baby. When a mother is not well enough, partners are encouraged to have skin-to-skin contact with their baby to keep the baby warm and to help build a loving relationship. Skin-to-skin contact is seen in every labour ward in the UK and is a key part of the Unicef UK Baby Friendly Initiative standards, irrespective of feeding type. Over the period of this investigation, 82% of babies in England would have received skin-to-skin contact at birth.

The extremely valuable observations raised by the families and investigation team in this report reminds us that vigilance of the baby's wellbeing is a fundamental part of postnatal care immediately following and in the first few hours after birth. Each case reinforces the need for close and ongoing observation of the baby and mother/partner while in skin-to-skin contact, careful positioning of the mother and baby and, most importantly, the need to listen carefully to any concerns raised by the parents.

The Unicef UK Baby Friendly Initiative recommends that:

- maternity services update their own policies to ensure that these adhere to the recommendations
- the recommendations are disseminated to staff as soon as possible and are included in future staff updates
- all staff are enabled to implement the findings effectively.

Every incidence of SUPC is one too many. Working together we can ensure that all babies are kept safe, while still enabling babies, their mothers and families to benefit from the many advantages of skin-to-skin contact.

Summary and learning observations

Summary

The Healthcare Safety Investigation Branch (HSIB) (England) is responsible for all NHS patient safety investigations of maternity incidents which meet criteria for the Each Baby Counts programme (Royal College of Obstetricians and Gynaecologists, 2015). The purpose of the programme is to achieve rapid learning and improvement in maternity services.

The HSIB Summary of themes arising from HSIB maternity investigation programme report (March 2020) describes eight themes arising from the maternity investigations. Sudden unexpected postnatal collapse (SUPC) was identified as a theme for further exploration in order to highlight areas of system-wide learning. SUPC is a rare but potentially fatal event in otherwise healthy-appearing term (born after 37 completed weeks) newborn babies at birth. Between April 2018 and August 2019 HSIB completed 335 maternity investigations. Of these, 12 cases met the SUPC criteria (3.6%).

Of the 12 cases identified, contributory factors of SUPC included: persistent pulmonary hypertension (2), sepsis (infection) after birth (3), choanal stenosis (narrowed nostrils) (1), opiate use in the antenatal period (3), possible stroke in the baby in pregnancy (1).

In 6 of the 12 identified cases (1.8%), positioning of the baby to achieve skin-to-skin contact may have contributed to SUPC.

While the number of incidents found was small compared to the number of term babies who had skin-to-skin contact at birth (82% of 603,766 births in England 2018/19) (NHS Digital, 2019) these incidents may in future be avoided and so learning is essential.

Learning observations

- Based on the evidence, a baby who is born apparently well, with good Apgar scores [1], can be safely laid skin-to-skin with the mother or parent and requires close observation in the first minutes after birth.
- Apgar scores must be attributed using close clinical observation of the baby. This can be achieved with the baby remaining in skin-to-skin contact. There may be a need to interrupt skin-to-skin contact briefly to ensure Apgar scoring is assessed accurately.
- Vigilant observation of the mother and baby should continue, with prompt removal of the baby if the health of either gives concern.
- Mothers should be encouraged to be in a semi-recumbent (half lying, half sitting) position to hold and feed their baby, ensuring the mother can see the baby’s face.
- Care should be taken to ensure that the baby’s position is such that their airway remains clear and does not become obstructed.

- Staff should have a conversation with the mother and her companion about recognising any changes in the baby's condition.
- Always listen to parents and respond immediately to any concerns raised.
- Medicines given to the mother should be considered when discussing skin-to-skin contact. Pain relief given to mothers can affect their ability to observe and care for their baby.
- Additional risk factors should be considered. The level of risk for SUPC when a baby is in skin-to-skin contact can increase with, for example, increased maternal body mass index, antenatal use of opiate medication, sedation, and staffs' focus on other tasks.

Maternity investigations – emerging learning from 2019/2020

HSIB published a national learning report, Summary of themes arising from HSIB maternity investigation programme in (March 2020) describing eight themes arising from its early maternity investigations. Sudden unexpected postnatal collapse (SUPC) was identified as a theme for further exploration in order to highlight areas of system-wide learning.

SUPC is a rare but potentially fatal event in otherwise healthy-appearing term newborn babies. Although the incidence of SUPC is small many of these incidents could be avoided and so learning is essential.

The definition of SUPC varies slightly depending on the author and population studied. The British Association of Perinatal Medicine definition of SUPC includes:

'any term or near-term (defined as >37 weeks' gestation in this review) infant who meets the following criteria:

1. Is well at birth: normal 5-minute Apgar and deemed well enough for routine care, (i.e., a score of 7 and above).
2. Collapses unexpectedly in a state of cardiorespiratory extremis (severe collapse involving heart and lungs).
3. Such that resuscitation with intermittent positive-pressure ventilation is required.
4. Collapses within the first 7 days of life and dies.
5. Goes on to require intensive care or develops encephalopathy'.

(British Association of Perinatal Medicine, 2015).

Other potential medical conditions should be excluded (for example, sepsis, cardiac (heart) disease) for SUPC to be diagnosed. The incidence of SUPC in the first hours to days of life varies widely because of different definitions; it is estimated to be 2.6 to 133 cases per 100,000 newborns. In one case series, the authors described a third of SUPC events occurring in the first 2 hours of life, a third occurring between 2 and 24 hours of life, and the final third occurring between 1 and 7 days of life (Pejovic and Herlenius, 2013). Other authors suggested that 73% of SUPC events occur in the first two hours of life (Becher et al., 2012).

Method

Approach

All maternity investigations are reviewed, and themes identified by a Healthcare Safety Investigation Branch (HSIB) multi-professional panel which includes neonatologists, midwives and obstetricians. HSIB identified that a review of cases containing sudden unexpected postnatal collapse (SUPC) would generate potential learning for maternity care. The cases identified were low in number, but the ability to reduce harm is achievable with minimal interventions and cost.

Cases with specific diagnoses have been included in this review to ensure broader learning and therefore the British Association of Perinatal Medicine definition of SUPC was used as a starting point for the review of these cases.

Selecting cases for analysis

On 28 January 2020 the HSIB database of 335 of completed maternity investigations (which includes cases reported between April 2018 and August 2019) was interrogated. Intrapartum stillbirth (stillbirth occurring during labour) and maternal death cases were excluded. The key words used to identify cases including SUPC were:

- skin-to-skin
- sudden collapse
- sudden unexpected
- unexpected collapse
- collapse
- opiate [3].

Seventeen cases were extracted and reviewed by a multi-professional team to identify potential learning for maternity care.

Of the 17 cases, five were removed from the analysis as they did not meet the criteria for inclusion; this left a total of 12 cases. Of the five that were removed, one was incorrectly classified as a complete report yet remained in draft form, and four did not meet SUPC criteria; this left a total of 12 cases [4].

Of the 12 cases that met SUPC criteria during skin-to-skin care:

- There were two babies with potential or diagnosed persistent pulmonary hypertension (PPHN) [5]. These cases were included as the reports indicated that PPHN was diagnosed after the baby's collapse.
- There were three babies treated for sepsis after birth. These cases were included as reports indicated that the diagnosis of sepsis was not confirmed.
- One baby was diagnosed with choanal stenosis (narrowed nostrils) and a floppy larynx (voice box). This report was included because these features would not be easily visible on an initial review after birth. This developmental vulnerability could be associated with increased risk of airway obstruction, especially when the baby is at the breast and if they are not carefully placed with the head straight and neck upright when in skin-to-skin contact so that the airway remains patent (open).
- Three mothers were prescribed opiates during the antenatal and labour period. Although the impact of opiates in labour for newborn babies can include short-term slowing of the baby's breathing (respiratory depression) and drowsiness, it is also recognised that sometimes opiates can lead to drowsiness after an initial alert period immediately following the delivery, thus leading to delayed but potentially significant respiratory depression.
- In one case, an ultrasound of the baby's head at 11 days of age demonstrated a possible stroke was likely to have occurred in late pregnancy (third trimester). This case was included because this would not have been evident on reviewing the day after birth. Depending on the extent and site of the possible stroke, it may have affected the areas of the brain that determine respiratory function and/or led to seizures which may be subtle and cause cardiorespiratory compromise.

Outcomes

In 3 of the 12 cases the baby died. Post-mortems described hypoxic brain injury (injury due to lack of oxygen) in two cases and a pulmonary haemorrhage (bleeding into the lungs) in one case.

All babies in the remaining nine cases were treated in neonatal intensive care units. Treatment included therapeutic cooling [6] in seven out of the nine cases; one baby was treated with extracorporeal membrane oxygenation (ECMO) [7] due to diagnosis of PPHN; one baby received cooling followed by treatment with continuous positive airway pressure (CPAP) [8] for

24 hours due to experiencing periods of breathing cessation lasting more than 20 seconds (apnoeic episodes) after extubation [9]. All babies had an MRI scan. Of the nine surviving babies' MRI scans, one showed evidence of a stroke during the antenatal period; the remaining eight babies' scans were reported as showing no evidence of any harm. Babies were discharged aged between 6 and 15 days old.

Analysis

The analysis of investigation reports was performed using qualitative analysis. Reviewers did not access case notes or individual interviews during the review.

Due to the small number of cases identified, HSIB was unable to identify themes. Instead 'observations' are described.

Observations are described according to where they exist within the socio-technical system. The components defined in the Systems Engineering Initiative for Patient Safety model (SEIPS) (Holden et al., 2013) (person, tasks, tools and technologies, physical environment and organisation conditions) were used to guide analysis of the reports.

Observations

Skin-to-skin contact

While there may have been other causative factors, this report focuses on how skin-to-skin contact may have contributed to sudden unexpected postnatal collapse (SUPC). Six of the 12 identified cases (1.8% of 335 cases investigated) suggest positioning of the baby to achieve skin-to-skin contact may have had an impact. Of the other six cases, two were associated with breastfeeding, two were unknown, and two were in skin-to-skin contact with other family members. While the number of incidents found was small compared to the number of term babies who have skin-to-skin contact at birth (82% in England) (NHS Digital, 2019) these incidents may have been avoided and so learning is essential.

Background and evidence

Skin-to-skin contact has physiological and psychological benefits for both the mother and baby. It is recommended by the World Health Organization (2019), National Institute for Health and Care Excellence (2017), Public Health England (2016) and Unicef UK (2016) and has become established practice in England, with most mothers having skin-to-skin contact with their babies after birth (NHS Digital, 2020). Good practice is to discuss skin-to-skin contact with the mother antenatally and intrapartum (prior to, and during labour) and then, with the mother's consent, place the baby onto the mother's chest after birth, to enable skin-to-skin contact to take place.

This process triggers both the baby's and mother's instinctive behaviours, which helps to establish mother and baby attachment and supports the baby to seek out food (Moore et al, 2016).

'A Cochrane systematic review has shown through randomised controlled trials that skin-to-skin contact in the first hour after birth:

- calms and relaxes both mother and baby
- regulates the baby's heart rate and breathing, helping them to better adapt to life outside the womb
- stimulates digestion and an interest in feeding
- regulates the baby's temperature
- enables colonisation of the baby's skin with the mother's friendly bacteria, thus providing protection against infection
- stimulates the release of hormones to support breastfeeding and mothering'.

(Moore et al, 2016)

Evidence suggests that babies who are placed skin to-skin will:

- 'initially cry briefly – a very distinctive birth cry
- enter a stage of relaxation, where they display very little movement as they recover from the birth
- start to wake up, opening their eyes and showing some response to their mother's voice
- begin to move, initially little movements, perhaps of the arms, shoulders and head
- as these movements increase the baby will draw up their knees and appear to move or crawl towards the breast
- once they have found the breast, they will tend to rest for a little while (often this can be mistaken as the baby being not hungry or not wanting to feed)
- after a period of rest the baby will start to familiarise with the breast, perhaps by nuzzling, smelling and licking around the area. This familiarisation period can last for some time and is important so should not be rushed. Sometimes it is tempting to help baby to attach at this time, but mothers are advised to remain patient to allow the baby to work out how best to attach themselves
- finally, baby will self-attach and begin to feed. It may be that mother and baby need a little help with positioning at this stage once baby has suckled for a period, they will come off the breast and often both mother and baby will fall asleep'.

(Unicef UK, n.d. a; Widstrom et al., 2011; Cadwell et al., 2018)

The Unicef UK Baby Friendly Initiative Standards

The Unicef UK Baby Friendly Initiative is based on a global accreditation programme of UNICEF and the World Health Organization (WHO) (World Health Organization, 2019). Since the global WHO/UNICEF Baby Friendly Hospital Initiative began more than 15,000 facilities in 134 countries have been awarded Baby Friendly status. In many areas where hospitals have been designated Baby Friendly, more mothers are breastfeeding their infants, and child health has improved (Lancet series, 2016; Acta Paediatrica, 2015; Perez-Escamilla et al., 2016). Thanks to this work, UK breastfeeding initiation rates have risen by over 20% since the Baby Friendly Initiative was established (Unicef UK, 2013a).

The Unicef UK Baby Friendly Initiative Standards are also designed to support parents who are formula feeding and to support all families to develop close and loving relationships with their newborn and to understand the importance of this for their baby's development.

The global WHO/UNICEF Baby Friendly Hospital Initiative (World Health Organization, 2019) and Unicef UK Baby Friendly Initiative (Unicef UK, 2013a) require that all mothers or parents and babies have skin-to-skin contact with their baby as soon as possible after birth, at least until after the first feed and for as long as they wish. Mothers should be encouraged to have the first feed during the initial skin-to-skin contact. If it has not been possible straight after the birth, skin-to-skin contact should be encouraged as soon as the mother and baby are able.

Current trust engagement in England with the Unicef UK Baby Friendly Initiative

The Unicef UK Baby Friendly Initiative is built on evidence-based standards which interlink supporting maternity, health visiting, children's centres and neonatal services. It aims to transform the care these services provide by setting standards, providing training and support, and assessing progress by measuring the skills and knowledge of health professionals and interviewing mothers to hear about their personal experiences of care (Unicef UK, 2013b). The majority of maternity units (93%), health visiting services (91%) and neonatal units (50%) across the UK are now working towards Baby Friendly accreditation (Unicef UK, n.d. b).

Skin-to-skin observations from HSIB reports

A baby who is born apparently well, with good Apgar scores, can be safely laid skin-to-skin with the mother or parent but still requires close observation in the first minutes after birth.

Guidance provided by the Unicef UK Baby Friendly Initiative notes that staff should have a conversation with the mother and her birth partner as soon as is practicably possible after the birth about the importance of recognising changes in the baby's colour or tone and the need to alert staff immediately if they are concerned (see Unicef website for full guidance).

Mothers should be encouraged to be in a position to safely hold and feed their babies. The following excerpt from a maternity investigation report, highlights an incidence of SUPC in which the mother was not physically able to see or reposition her baby during skin-to-skin contact.

> 'The baby was dried and appropriately placed on the mother's chest for skin-to-skin contact immediately after birth as per local and national guidance (UNICEF UK) as the baby was born in good condition with an Apgar score of 9 at 1 minute; 9 at 5 minutes and 10 at 10 minutes of age. The mother could not see the baby's face during this time [due to maternal position]. Staff in the room, who were inspecting the mother's perineum, described the baby as lying face down with their face turned to the side on the mother's chest and that staff were able to see the baby's face'.

Care should be taken with the position of the baby, ensuring the head is supported so the infant's airway does not become obstructed, and that the mother is aware of the importance of the baby's position. The following excerpt from a Healthcare Safety Investigation Branch (HSIB) maternity investigation report highlights an incidence of SUPC in which the positioning of the baby for skin-to-skin contact was not optimal.

> 'It is unclear if the family were counselled with regard to the positioning of baby for an optimal skin-to-skin experience, and photographic evidence shared with HSIB investigators by the family demonstrates that the baby was not in the optimal position. The baby was not lying directly on the mother's chest, and the position of the baby's head would indicate that the baby was lying prone [face down] on the mother's chest. The baby remained in this position for approximately 37 minutes until the perineal repair … was completed, whereupon the baby was noted to be pale and floppy. The baby was then promptly transferred to the neonatal resuscitaire [10] for assessment'.

In the following two cases the baby was found at the mother's breast when SUPC was recognised (note the first incident also took place during evening shift handover).

In one case:

> ‘The mother delivered quickly once labour established; the baby was born in good condition and placed skin-to-skin on the mother’s chest. The mother’s perineum required suturing [repairing], so was placed in the correct position for assessment, the baby remained skin-to-skin. The mother commenced breast feeding while continuing to use gas and air for pain relief. At 33 minutes of age the baby was found to be not breathing, white in colour and floppy in tone’.

In a second case:

> ‘In accordance with both local and national guidance, the baby was put to the breast … with the assistance of the baby’s father and the midwife … The mother was in a sitting position, semi-upright at the time with the baby lying across her abdomen. The midwife helped the mother to attach the baby to the breast. The night duty midwife entered the room at 20:18 hours, 13 minutes after the baby was first put to the breast and introduced herself. At this time the baby’s mother asked the midwife to check the baby. The midwife looked at the baby and noted the baby’s arm flop down by its side’.

Many mothers can continue to hold their baby in skin-to-skin contact during perineal suturing, providing they have adequate pain relief. However, a mother who is in pain may not be able to hold her baby safely.

Additional risk factors should be considered for SUPC when a baby is in skin-to-skin contact, and if present should be discussed with the mother. The aim is to reduce these risks. Examples are:

- antenatal use of opiate medication
- mothers should not be in a fully recumbent position when holding their baby, they should be encouraged to be in a semi-recumbent position
- the baby’s position should ensure they have a clear airway and the mother can see the baby’s face
- staff should have a conversation with the mother and her companion about recognising any changes in the baby’s condition
- always listen to parents and respond immediately to any concerns raised
- pain relief and medication given to mothers can affect their ability to observe and care for their baby
- sedation, general anaesthetic

- raised maternal body mass index
- staff being focused on other tasks.

Babies should not be in skin-to-skin contact with their mothers when the mothers are receiving Entonox or other analgesics (painkillers) that effect their consciousness and awareness of the baby's position. Pain relief medication given to mothers can affect their ability to observe and care for their baby and these medications should be considered when discussing skin-to-skin contact. If the mother is unable to provide skin-to-skin care it is possible that the birth partner can undertake this in the initial post-birth period. If the birth partner is not present a baby can be placed under a warm resuscitaire close to a mother and in her line of sight.

In two further cases of SUPC during skin-to-skin contact investigators noted that the mother was treated with opiates before delivery of the baby. The effects of opiate administration on a mother in labour are commonly noted as drowsiness, nausea, and vomiting (National Institute for Health and Care Excellence, 2017). In addition, the effect of opiate analgesia in labour for newborn babies can include short-term respiratory depression and drowsiness. (National Institute for Health and Care Excellence, 2017).

In one of these cases it is unclear whether the mother's prescription for antenatal opiates was communicated to the midwifery team as highlighted in the following HSIB recommendation:

'The Trust to ensure there is a risk assessment and clear pathway of communication from obstetrics to midwifery and neonatology detailing when the unborn baby has been exposed to ongoing prescribed opiates/medication in the antenatal period.'

Skin-to-skin observations from HSIB clinical panel discussions

All HSIB maternity investigations are reviewed by a multi-professional clinical panel. Panel members include subject matter advisors in obstetrics, midwifery, neonatology, and anaesthetics. Investigations are reviewed by the panel at multiple milestones throughout the investigation process.

In addition to the above observations emerging from investigation reports, discussions during report panels identified the potential for error when obtaining Apgar scores.

The five observations of heartrate, colour, tone, reflex and respiratory effort at one, five and 10 minutes are each given a score of 0, 1 or 2. The total of these scores is referred to as the Apgar score. The maximum score is 10; the lower the score the greater the need for the baby to receive additional support.

The HSIB learning observations have identified that when attributing an Apgar score to a newborn baby, staff should not observe from a distance but should ensure close observation is undertaken to assess the Apgar score.

Monitoring the wellbeing of a newborn infant is a fundamental part of postnatal care immediately following and in the first few hours after birth. Two of the five Apgar score questions – respiration and colour – can be answered visually. Reflex to stimulation and muscle tone require the baby to be touched. Checking a baby's muscle tone by appearance only can be misleading; a baby may appear to have good movement while at the same time having reduced quality of tone. Best practice also suggests that heart rate can only by checked by listening to the heartbeat using a stethoscope.

HSIB's clinical panel has noted that although one-minute checks are performed visually and by listening (for heart rate), and handling the newborn baby for tone, clinicians have described performing five and 10-minute Apgar checks visually only. Clinicians have advised that the baby's heart rate may not be listened to during five and 10-minute checks because the baby had a good colour and cried immediately after birth. HSIB considers that the formal process of Apgar checks requires review to minimise the subjective nature of these assessments and to inform guidance.

Systemic risk factors

Guidance (both local guidance and the national guidance produced by the British Association of Perinatal Medicine (2015)) stresses the importance of health professionals remaining vigilant of the baby's wellbeing during the first 24 hours of life. The observations described below highlight how it may not be possible to maintain such vigilance.

Task factors

The period following birth is a busy time for midwives. Postnatal midwifery tasks include delivery of the placenta, reassuring the family, taking observations, cleaning the mother and making her comfortable, weighing and monitoring blood loss, checking the mother's perineum, sharing information about any immediate concerns, offering the mother the opportunity to wash, weighing the baby, administering vitamin K, and completing documentation, some of which require the midwife to leave the mother unattended. This is in addition to monitoring the baby whilst in skin-to-skin contact with the mother, father or birth partner.

In five of the cases identified, the baby collapsed whilst the midwife was engaged in tasks as outlined above. In these five cases, the collapse of the baby occurred or was detected between 8 minutes and 45 minutes (median 33 minutes) after birth. Tasks included repairing (suturing) a perineal tear while maintaining a sterile field and inspecting the mother's perineum for trauma.

In one case the baby was found collapsed during skin-to-skin contact with the father while the midwife attended to the mother who was vomiting persistently.

Attention capacity and clinician experience is a finite resource; during periods of high task demands it is not possible to successfully divide attention across multiple competing tasks. Without attention, events with great consequence (such as deterioration of a baby's condition) may go undetected. Ability to detect changes decreases under high task load, for example when midwives are engaged in attention-demanding tasks such as suturing. Events are also more likely to be missed when they occur outside an individual's field of view (that is, the observable area a person can see) and when the event is not probable or out of the range of expectations (such as SUPC).

Tools and technologies

In two cases the midwife left the delivery room either to find equipment to complete a task or to complete documentation due to lack of equipment (a working computer) within the delivery room.

'The midwife had to leave the delivery room on multiple occasions in order to collect equipment required for suturing. This involved finding the coordinator to locate the drug cupboard keys, collect suturing material from the stock cupboard and obtaining local anaesthetic from another location on delivery suite'.

The system failure of not having the correct fully functioning equipment within the delivery room meant that the midwife was not always physically present to monitor the baby. In one of these cases the baby collapsed whilst the midwife was not in the room.

It is also possible that the extra steps required to find equipment impacted clinicians' capacity to process information, potentially adding mental stressors and frustrations to the clinicians' working environment. As described above, humans are limited information processors and therefore excessive mental workload impacts information processing in much the same way as physical workload impacts energy use.

Physical environment

One report commented that:

'When it was recognised that the baby had poor colour and tone, it was recorded in the resuscitation notes, that the baby needed to be moved to the resuscitaire in the corridor to be examined under a better light'.

Although the report later notes that ‘No one present in the room at the time recalled the room being dark’, insufficient lighting could impact on a health professional’s ability to detect visual changes in a baby’s appearance indicative of a postnatal collapse.

In addition, it is standard practice to place warm towels or blankets securely over the baby and place a hat onto the baby’s head so that body heat is not lost. This practice reduces the amount of skin a health professional can see, reducing their ability to detect paleness or pallor. Clinicians should also acknowledge that a cold baby has increased oxygen consumption and cold babies are more likely to become hypoglycaemic and acidotic (O’Donnell et al., 2007).

Organisational conditions

Two cases describe issues with staffing and the associated additional workload, these cases were not related specifically to the individual SUPC and were related to the organisational workload and the impact on staff.

For example, one report notes:

‘The mother remained on the antenatal ward throughout the day as the delivery suite continued to be unable to accept the mother due to their staffing levels and workload’.

A second report describes suboptimal skill mix on a night shift:

‘The ratio of newly qualified midwives to experienced midwives on shift was 37.5% of the total workforce (50% of the midwives on delivery suite). These midwives require a greater level of supervision which was difficult to provide.’

Although procedures are in place to bring community based midwifery staff into the hospital when required, one report described a reluctance to call on staff knowing the potential impact this might have on community care.

‘If additional midwives are required during a shift, an on-call system is in place to obtain support from the community midwives who are on-call for homebirths and midwifery led units. Four midwives should be on call for community across the whole Trust geographical area, sometimes this falls to three on call midwives. It was described by staff that they are aware of the implications and potential impact on the community services if a midwife had to be called in. This impacted on the decision as to whether the coordinator calls additional staff in’.

Staffing issues can affect the flow and workload in a department and resources to address staffing should be used to support workforce planning (National Institute for Health and Care Excellence, 2015).

National safety actions resulting from HSIB investigations

Safety actions are actions taken during a Healthcare Safety Investigation Branch (HSIB) investigation to immediately improve patient safety. HSIB and Unicef UK have collaborated to continue improving safety for post-birth skin-to-skin contact while emphasising the benefits of the practice.

As a result of HSIB's investigations, Unicef UK's guidance relating to monitoring during skin-to-skin contact (Unicef UK, n.d. a) was updated to include more specific guidance based on the findings:

'The HSIB, as part of the Safer Maternity Care Action Plan, have been investigating serious untoward incidents involving babies in the first week of life. Findings indicate that 1.8% (n=6) of the cases reviewed so far involve babies in skin-to-skin contact with their parents in the immediate postnatal period where position of the baby has an impact. All cases involve babies over 37 weeks gestation, who were deemed well at birth (e.g. normal 5-minute Apgar recorded) and therefore could have 'normal care'. Several observations were identified from the HSIB investigations:

- A baby who is born apparently well, with good Apgar scores, can be safely laid skin-to-skin with the mother or parent but still requires close observation in the first minutes after birth. Care should be taken with the position of the baby, ensuring the head is supported so the infant's airway does not become obstructed, and the baby's mouth and nose are free from the mother's body.
- The level of risk for SUPC when a baby is in skin-to-skin contact can increase with additional contributory factors, for example, maternal body mass index, antenatal use of opiate medication, sedation and staffs' focus on other tasks.
- Pain relief medication given to mothers can affect their ability to observe and care for their baby and these medications should be considered when discussing skin-to-skin contact.

Working with the HSIB, the Unicef UK Baby Friendly Initiative maternity policy statement on safety during skin contact has been updated (see below). The changes made include more information on maternal position, ensuring ongoing thorough monitoring of the mother and baby and listening carefully to any concerns raised by the parents about their baby's condition.

Unicef UK recommend that maternity services update their own policies to bring them into line with these new recommendations, disseminate this information to staff as soon as possible and include in future staff updates related to the Baby Friendly standards'.

Unicef UK, October 2019

Safety Considerations (Skin-to-Skin)

Vigilance of the baby's well-being is a fundamental part of postnatal care immediately following and in the first few hours after birth. For this reason, normal observations of the baby's temperature, breathing, colour and tone should continue throughout the period of skin-to-skin contact in the same way as would occur if the baby were in a cot (this includes calculation of the Apgar score at 1, 5 and 10 minutes following birth). Care should always be taken to ensure that the baby is kept warm. Observations should also be made of the mother, with prompt removal of the baby if the health of either gives rise to concern.

Staff should have a conversation with the mother and her companion about the importance of recognising changes in the baby's colour or tone and the need to alert staff immediately if they are concerned.

It is important to ensure that the baby cannot fall on to the floor or become trapped in bedding or by the mother's body. Mothers should be encouraged to be in a semi-recumbent position to hold and feed their baby. Particular care should be taken with the position of the baby, ensuring the head is supported so the infant's airway does not become obstructed.

Notes – Mothers

- Observations of the mother's vital signs and level of consciousness should be continued throughout the period of skin-to-skin contact. Mothers may be very tired following birth and so may need constant support and supervision to observe changes in their baby's condition or to reposition their baby when needed.
- Many mothers can continue to hold their baby in skin-to-skin contact during perineal suturing, providing they have adequate pain relief. However, a mother who is in pain may not be able to hold her baby safely. Babies should not be in skin-to-skin contact with their mothers when they are receiving Entonox or other analgesics that impact consciousness. As an alternative, staff could support the birth partner to have skin-to-skin contact until the procedure is completed.

Notes – Babies

All babies should be routinely monitored whilst in skin-to-skin contact with mother or father. Observation to include:

- Checking that the baby's position is such that a clear airway is maintained – observe respiratory rate and chest movement. Listen for unusual breathing sounds or absence of noise from the baby
- Colour - the baby should be assessed by looking at the whole of the baby's body as the limbs can often be discoloured first. Subtle changes to colour indicate changes in the baby's condition
- Tone – the baby should have a good tone and not be limp or unresponsive
- Temperature – ensure the baby is kept warm during skin contact

Always listen to parents and respond immediately to any concerns raised.

See: **https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/skin-to-skin-contact/**

Unicef UK Baby Friendly Initiative: Sample Infant feeding policy (maternity) **https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/sample-infant-feeding-policies/**

Local safety actions informed by HSIB investigations

As a result of HSIB investigations, several trusts have developed information posters and one trust has developed the ‘holding your baby safely’ poster alongside a checklist (Figure 1) and a postnatal risk assessment (Figure 2). This was created in order to inform women and their families of the importance of ‘holding your baby safely’ (Shawley, 2019). Advice informs families to ensure that a baby’s face can always be seen. The advice aims to ensure that a baby’s head has support and the airway is maintained. Posters in the labour and postnatal wards provide information to all staff to support them to have discussions with each woman in the first hour after birth to reinforce the message and improve safety. Further work is required to evaluate this work.

Fig 1 Poster and checklist

Postnatal Risk Assessment Matrix (PRAM)

"Skin to Skin - but watch my chin"

Holding Your Baby Safely

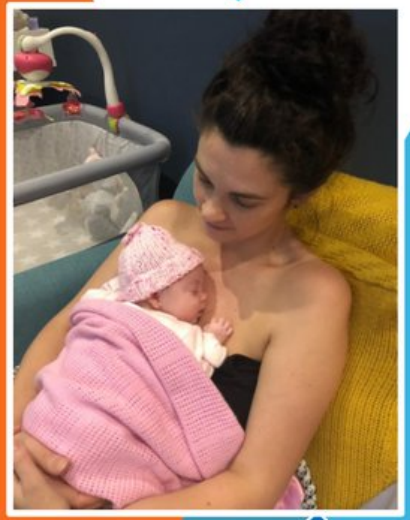
I am calm



Please make sure my **neck is straight** and my **head is upright** so I can breathe easily…

…and that you can always **see my face** so you can check I'm ok (and I love to be able to see you too)

I am safe



I feel loved

We feel warm

We can get to know each other



Dr Cindy Shawley
November 2018

CARE AND COMPASSION ACCOUNTABILITY RESPECT ENCOURAGING EACH OTHER

Midwife to have a conversation with the woman and her family regarding the poster to ensure that they know how to support and maintain the baby's airway. To be done on labour ward just after the birth.

Midwife Details:

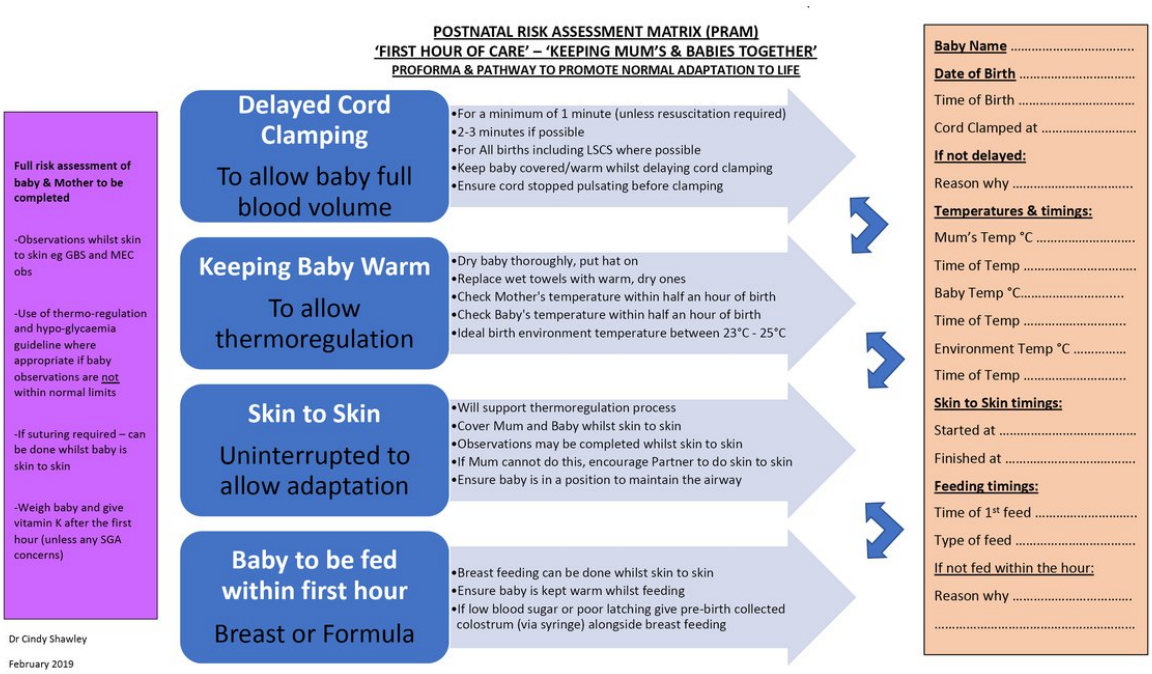
Name ……

Signature ……

Date ……Time……

CHECK LIST:	PLEASE TICK
Mother's Observations	
Baby observations if required	
Tea and Toast	
Hand written notes completed	
Initial (head to toe) baby check completed	
Baby weight, name bands, vitamin K given	
Shower, bath or bed bath	
Bed linen changed	
Electronic notes completed	

Fig 2 Postnatal risk assessment



Conclusion

This report has reviewed investigations conducted by the Healthcare Safety Investigation Branch (HSIB) regarding sudden unexpected postnatal collapse (SUPC) and skin-to-skin contact. The aim of this report is to support the maternity system to continue to safely provide evidence-based practice of skin-to-skin contact to help a baby adjust to life outside the womb and to support the establishment of breastfeeding. While the number of reported cases of SUPC relating to skin-to-skin contact are small, the impact is significant, and changes can be made to reduce the number of events further. HSIB encourages collaborative working between the Department of Health and Social Care, Unicef UK Baby Friendly Initiative and Public Health England to discuss the implementation of effective barriers to prevent SUPC associated with skin-to-skin contact.

Unicef UK Baby Friendly Initiative has updated its policy guidance in the light of our investigations and some organisations are using posters and checklists to help staff understand and carry out their responsibilities. HSIB has also observed the impact of high task load, environment and staffing levels on the ability of staff to detect SUPC.

Maternity services should consider the following learning observations to ensure safe delivery of skin-to-skin care.

- Based on the evidence, a baby who is born apparently well, with good Apgar scores, can be safely laid skin-to-skin with the mother or parent and requires close observation in the first minutes after birth.
- Apgar scores must be attributed using close clinical observation of the baby. This can be achieved with the baby remaining in skin-to-skin contact. There may be a need to interrupt skin-to-skin contact briefly to ensure Apgar scoring is assessed accurately.
- Vigilant observation of the mother and baby should continue, with prompt removal of the baby if the health of either gives concern.
- Mothers should be encouraged to be in a semi-recumbent (half lying, half sitting) position to hold and feed their baby, ensuring the mother can see the baby's face.
- Care should be taken to ensure that the baby's position is such that their airway remains clear and does not become obstructed.
- Staff should have a conversation with the mother and her companion about recognising any changes in the baby's condition.
- Always listen to parents and respond immediately to any concerns raised.
- Medicines given to the mother should be considered when discussing skin-to-skin contact. Pain relief given to mothers can affect their ability to observe and care for their baby.
- Additional risk factors should also be considered. The level of risk for SUPC when a baby is in skin-to-skin contact can increase with, for example, increased maternal body mass index, antenatal use of opiate medication, sedation, and staff's focus on other tasks.

Endnotes

[1] An Apgar score is a score used to assess a baby's wellbeing immediately after birth and at five and 10-minutes after delivery. Components of the score are skin colour, response, heart rate, breathing and muscle tone. The maximum score is 10, the lower the score the greater the need for the baby to receive additional support. Scoring of Apgar can be subjective.

[2] The legal duty to be open and honest with patients and their families when something goes wrong that causes harm.

[3] Opiates are a group of painkillers including morphine and medicines derived from morphine.

[4] It is acknowledged that HSIB investigates cases matching the Royal College of Obstetricians and Gynaecologists' 'Each Baby Counts' criteria; by their very nature these babies were born ill or became ill shortly after birth.

[5] Persistent pulmonary hypertension of the newborn (PPHN) is a condition where the blood vessels in the baby's lungs do not open normally after birth. This results in high pressure in the vessels in the lungs and prevents blood picking up oxygen normally. (Adapted from Great Ormond Street Hospital information sheet (Great Ormond Street Hospital, 2016).

[6] Artificial cooling of babies who suffer lack of oxygen at birth has been shown to limit the extent of brain damage. (Adapted from Great Ormond Street Hospital information sheet (Great Ormond Street Hospital, 2016).

[7] Extracorporeal membrane oxygenation (ECMO) is a treatment where the baby's blood is pumped through a machine which removes carbon dioxide and adds oxygen, acting as an artificial lung.

[8] Continuous positive airway pressure (CPAP) involves applying pressure to the baby's airway via small tubes in the baby's nostrils. The pressure keeps the airways open and improves oxygen levels.

[9] After completing 72 hours of therapeutic cooling, babies are rewarmed and breathing support tubes are removed (extubation).

[10] A resuscitaire is a trolley designed to assist with resuscitating newborn babies. The trolley incorporates a bed for the baby, a heater, oxygen source and a suction device.

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