

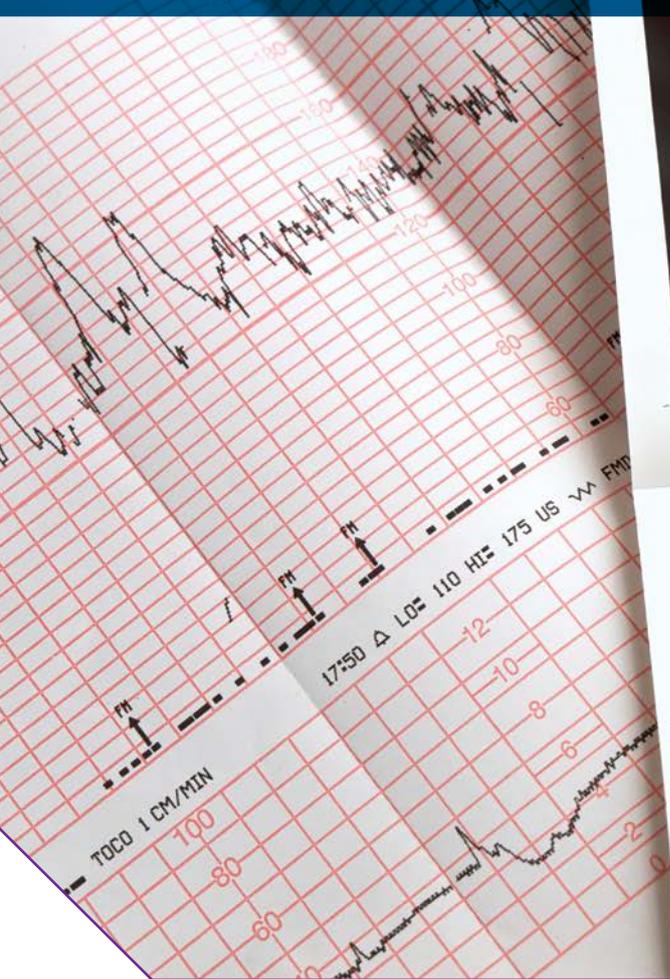


CLINICAL
EXCELLENCE
COMMISSION

CLINICAL FOCUS REPORT

FROM REVIEW OF CLINICAL INCIDENT REPORTS

Fetal monitoring: Are we getting it right?



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This report was prepared by the Clinical Excellence Commission (CEC) Patient Safety Team.

The information it contains has been de-identified and analysed in accordance with Incident Information Management System (IIMS) datasets and where relevant, the classification sets used by the CEC and the Root Cause Analysis Review Sub-committees.

It should be noted that all reviews of incident reports, including root cause analysis are retrospective and can reflect both hindsight and outcome bias. Such reviews are conducted to better understand the impact that patient, system and human factors may have on the provision of clinical care and to facilitate ongoing improvement across the health system.

This report is intended to provide a snapshot of issues identified and to make recommendation about system improvements to improve the safety and quality of clinical care.

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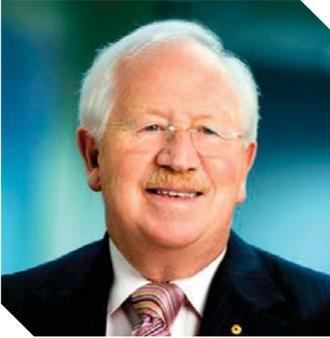
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Foreword

The role of the Clinical Excellence Commission is to assist NSW Health staff to provide patients with the best possible care for their conditions.

This analysis of aggregated information from the NSW Incident Information Management System (IIMS) is one of the best tools at our disposal. We also evaluate root cause analyses conducted after serious clinical incidents. The information and solutions for the issues identified are validated by clinical staff, managers and the State Clinical Risk Action Group.

This report is one of a series developed from this analysis process. Previous analyses and reports have triggered system-wide improvements, such as the Sepsis Kills Project, as well as raising awareness at the clinical level.

We greatly appreciate your interest in this report and look forward to your feedback.

A handwritten signature in black ink, which appears to read "Clifford Hughes". The signature is written in a cursive, flowing style.

Prof Clifford Hughes AO
Chief Executive Officer

March 2013



Background

This report has been prepared for consideration by antenatal and obstetric services in the NSW health system.

Early identification of risk factors, which may compromise maternal and/or fetal wellbeing during pregnancy, labour and delivery, are important elements of care. Fetal surveillance is recognised by the Maternal and Perinatal Committee¹ (the committee) as one such component of antenatal and intrapartum care. Guidelines which suggest the optimum level of surveillance in different situations have been applied across NSW Health services to ensure the best possible outcome for every baby. The committee was keen to explore if and how inadequate fetal surveillance may have contributed to serious perinatal incidents and to understand why this occurred.

Despite rigorous surveillance, some babies are compromised and sustain significant injury or die during pregnancy/labour and delivery. The reasons cannot always be identified. Whenever the death of a baby is unexpected and unexplained, the care of the mother and baby is reviewed, using root cause analysis (RCA) methodology². This process seeks to identify all factors, which if recognised earlier, may have prevented the injury or death, so that steps can be taken to reduce the risk to other mothers and babies.

During its review processes, the committee identified issues around fetal surveillance in cases where babies were compromised. It was agreed that this warranted further examination.

1 The M&P RCA Review Committee is a sub-committee of the NSW Clinical Risk Review Committee. It meets five times each year to review all serious incidents related to maternal and perinatal care.

2 RCA is a method used to investigate and analyse a clinical incident to identify the root causes and factors that contributed to the incident and to recommend actions to prevent a similar occurrence.

Method

All RCA reports which had been classified by the committee as being related to fetal monitoring, were identified in the Clinical Excellence Commission (CEC) database in May 2011. Each was extracted for further review.

A search of the State-wide incident reporting system (IIMS)³ for incidents where the text included the terms “CTG” and/or “fetal monitoring” was also undertaken. The SAC2, SAC3 and SAC4⁴ incidents identified were also extracted.

Table 1: Initial data extraction

Report Type	Date range	Count
RCA reports	January 2010-May 2011	34
IIMS incident notifications		
SAC2	January 2010-April 2011	198
SAC3	January 2010-April 2011	1,000
SAC4	January 2010-April 2011	1,000

The classifications already assigned during the RCA review process were collated and any additional factors identified were added, in line with directed content analysis methodology. The recommendations and opportunities for improvement contained in RCA reports were also reviewed. This enabled the types and frequency of suggested solutions to be identified.

The 2,198 SAC2-4 incident reports were screened for relevance and most were excluded from the reviewed for the following reasons:

- They were about an unrelated matter, but fetal monitoring or CTG was mentioned in the text
- There was insufficient information to enable further analysis of the incident or report (the most common reason).

The remaining incidents underwent directed content analysis and classification to identify common factors and themes related to fetal monitoring. The classification sets used were those developed by the CEC Patient Safety Team and the RCA Review Sub-committee during their review processes. They include:

- Model of care and role delineation
- IIMS clinical management sub-classifications
- Highlighted clinical risk group (specific risks identified and monitored by the committee)
- System factors which may have contributed to the incident
- Human (staff) factors which may have contributed to the incident
- Underlying patient factors
- Types of recommendations made by RCA teams (see Appendix A)
- Opportunities for system improvement (see Appendix B).

3 IIMS – Incident Information Management System is an electronic system to notify and manage all incidents and risks to patient care in NSW public health services

4 In NSW incidents are classified using a severity assessment code (SAC) rating. SAC1 is the most serious and all clinical SAC1 incidents undergo RCA. SAC4 is least serious, including near events.

Findings

Twenty-nine RCA reports and 128 SAC2-SAC4 incidents were analysed. The findings are presented under sub-headings to assist the reader.

Model of Care and Role Delineation of the Maternity Unit

The model of care and role delineation is recorded in order to identify whether the level of care was appropriate for the mother and baby needs. The tables below show the model of care and the role delineation for the incidents which underwent RCA. These classifications could not be determined in most of the SAC2-4 incidents.

The model of care relates to the type of care provided during the antenatal period and planned for the birth of the baby. For example, a woman considered at normal risk may choose to access a primary model of care such as GP or midwifery-led antenatal care and delivery at a local hospital. Women who are deemed to be at higher risk may require more specialised care – for example, obstetrician-led antenatal care and delivery at a specialist service (tertiary care).

Role Delineation relates to the level of maternity service provided at each facility. This is an indicator of the maternity and perinatal service's capacity to manage mothers and babies of different complexity. For example, women who are assessed as being at higher risk should be booked into services with higher role delineation, such as level 6, which would have access to adult and neonatal intensive care services.

Many women with normal risk factors plan to give birth at a tertiary facility, while accessing a primary model of care, including case load midwifery and birth centre care. This plan is very often related to personal preference or location. From the information provided in the RCA reports, Table 2 shows the models of care under which the mother was managed and Table 3 shows the level of service provided at the facility where the incident occurred.

Table 2: Model of care

Model of care	Count
Tertiary	6
Secondary	6
Primary	17
Total	29

Table 3: Role delineation

Role delineation	Count
Level 1	0
Level 2	3
Level 3	5
Level 4	4
Level 5	10
Level 6	7
Total	29

Clinical Management Sub-classifications

A single clinical management sub-classification is applied to each RCA by the committee. It is based on the classification sets in IIMS and determined by group consensus, before being recorded in a CEC database to facilitate future reviews. Table 4 shows the clinical management sub-classification applied to each of the incidents. Some incidents could not be classified because there was insufficient information in the report, however, they were not excluded from further review.

Table 4: Clinical management sub-classification applied to each of the incidents

Clinical Management Sub-classification	SAC1 (RCAs)	SAC2	SAC3 - 4
Treatment delayed or inadequate	11	13	50
Monitoring/observations	11	5	21
Diagnosis delayed/missed	6	7	5
Investigation results not followed up	0	0	1
Not classified	1	3	23

As shown above, delayed or inadequate treatment and monitoring/observations were the most common clinical management sub-classifications overall. In many of the cases where the classification of treatment (delayed or inadequate) was applied, the incident report also identified issues with observation and monitoring.

Information about the current status of the mother and fetus is vital in determining the most appropriate treatment – and whether the original care plan needs to be altered. Ongoing monitoring provides feedback about the treatment provided, as well as changes in the patient's condition for any other reason. The incidents showed that inadequate monitoring and interpretation of clinical observations contributed to delays in diagnosis and treatment of fetal distress. The focus of this review is therefore on fetal monitoring in the context of its importance in overall care planning and delivery.

When monitoring and observation issues in the RCA group were further analysed, four sub-categories were identified, as shown in Table 5.

Table 5: Monitoring and observation sub-categories for the RCAs

Classification	Count
Monitoring and observation - not performed at expected frequency	1
Monitoring and observation - delay or failure to respond	4
Monitoring and observation - inappropriate response	1
Monitoring and observation - significance not recognised	5

CASE 1:**Monitoring and observations – frequency and recognition of significance**

A woman was confirmed as being fully dilated. During the second stage, which lasted for 80 minutes, the fetal heart rate (FHR) was auscultated six times. On five occasions the FHR was recorded as 140 beats/minute, and on the sixth time it was 152. At delivery, the baby had a heart rate of 60 beats/minute and was not breathing. Thick meconium was noted in the oral cavity and nasal passages. The baby died three days later.

The RCA team established that the woman was examined and monitored according to policy (Maternity-Fetal Heart Monitoring PD2010_040) during the first stage of labour. During the second stage, monitoring was less than adequate.

PD2010_040 requires that fetal heart auscultation should occur towards the end and after each contraction during the active second stage of labour.

Issues identified by the RCA team included:

1. There was failure to **monitor the fetal heart rate** adequately (recorded only six times) in the second stage.
2. The consecutive FHR readings of 140 **should have aroused suspicion** related to the fetal wellbeing and indicated the need for more continuous monitoring

The committee also concluded that the level of fetal surveillance during the second stage of labour was sub-optimal. There was non-compliance with the policy for the management of normal labour including fetal monitoring.



CASE 2:**Monitoring and observations – recognition and response, no fetal blood monitoring**

A woman, having her first baby, presented to the delivery suite in early labour at 40+8 weeks gestation. She had a two-day history of ruptured membranes. She was found to be tachycardic and febrile. She was given intravenous (IV) fluids and antibiotics and then later transferred to a larger facility for further management, because of persistent maternal and fetal tachycardia.

On arrival at the receiving facility, the woman was given pain relief, IV fluids, antibiotics and CTG monitoring was commenced. It was reassuring, with the exception of the FHR baseline of 165. The woman was still tachycardic and febrile. On assessment two hours later, she was 6-7 cm dilated and coping well with moderate contractions. The CTG was reassuring. Following review by the obstetric registrar CTG monitoring was discontinued.

Five hours later the woman was still not fully dilated. Syntocinon was commenced and CTG monitoring re-commenced according to protocol. Two hours later the woman was fully dilated. During the second stage of labour the CTG was noted to be suspicious. Decelerations were considered typical variable and there was loss of contact. One hour prior to delivery the FHR was documented as 170 beats /min. and again loss of contact problems were noted. Episodes of fetal bradycardia were also noted with recovery to the baseline. A compromised baby was delivered after a second stage lasting 150 minutes.

Issues identified by the RCA team include the following:

1. Continuing abnormalities in the CTG may not have been escalated to the nurse in charge or reviewed by the obstetric registrar and managed in consultation with the visiting medical officer.
2. The registrar only received a verbal report on the CTG interpretation.
3. The continued loss of contact during fetal monitoring warranted urgent review and intervention. Internal CTG monitoring and fetal blood sampling should have been considered.
4. There was a lack of recognition that the CTG was tracing the maternal pulse rather than the FHR. The woman had a pulse rate of 120-140 during contractions.

The RCA team considered the root cause to be: a failure to recognise the significance of loss of fetal heart rate and intervene when loss of contact was identified on the CTG. This led to unrecognised fetal distress in the last hour of labour resulting in a compromised baby who later died.

During the review of the RCA report, the committee identified inadequate communication between providers, skill mix and failure to apply policy and guidelines (in relation to CTG monitoring and escalation processes) as system factors which contributed to the incident. The possibility that the mother had an unrecognised sepsis was also noted.

The findings are supported by recent literature and NSW Health policy. Ayres-de-Campos et al (2010)⁶ state that cardiotocographic (CTG) monitoring remains the basis of intrapartum surveillance, but its interpretation by health care professionals remains its main weakness.

Elliott et al (2010)⁷ acknowledges the dilemma faced by clinicians when assessing CTG tracings. The question always arises “what level of tracing abnormality warrants intervention to prevent devastating” fetal morbidity or mortality.

Knox et al (2010)⁸ recommends that interdisciplinary fetal monitoring education should be offered on a regular basis.

NSW Health PD2010_040- Maternity-Fetal Heart Monitoring mandates that education should occur initially and then every 2-3 years.

In addition to CTG, fetal blood sampling can provide information about fetal wellbeing during labour and delivery.

Use of Fetal Scalp Blood Sampling

Fetal blood sampling is strongly recommended when an abnormal FHR pattern is detected, or in cases where fetal acidosis is suspected. Some contra-indications to the procedure are noted, for example, maternal infections, fetal bleeding disorders, prematurity or acute compromise, such as cord prolapse, where delivery needs to be expedited. FHR pattern interpretation is a screening tool only. Fetal blood sampling provides more definitive information about the fetal condition and, therefore, better informs clinical decision-making.

The RCAs were reviewed to identify if fetal blood sampling was indicated/undertaken – see Table 6.

Table 6: Intrapartum fetal blood sampling

Classification	Count
Fetal blood sampling done	3
Fetal blood sampling not indicated/appropriate/not noted	11
Fetal blood sampling may have been indicated but not done	15

It is not clear in some RCA reports whether fetal blood sampling was available on site.

CASE 3:

Monitoring and fetal blood sampling

A woman with spontaneous labour and ruptured membranes was noted to have meconium stained liquor. CTG was applied five hours prior to delivery with large periods where there was loss of contact. An epidural was inserted when the woman was 9cm dilated. At this time the CTG trace was noted to be pathological. A fetal scalp electrode was applied and fetal blood sampling showed a lactate of 8.2. An emergency caesarean was undertaken.

The IIMS incident notifier noted that earlier application of the fetal scalp electrode and interpretation of the CTG would have resulted in earlier notification of the consultant and earlier intervention.

Clinical Risk Groups

This is a grouping developed over time and used by the committee to identify emerging themes found in RCAs. This has proved over time to be a rich source of information in terms of clinical risks. Each RCA may have one or more of these classifications applied. All RCAs within the cohort had the clinical risk group “fetal monitoring” identified. Fifteen of the RCAs indicated that an emergency caesarean section was performed and in three cases, issues associated with neonatal resuscitation were identified.

System factors which may have contributed to Incidents

Each RCA and IIMS report was reviewed to identify system factors which may have contributed to the incident. More than one system factor may be identified in each report. Table 7 shows the system factors by broad category.

Table 7: System factors by broad category

System factors identified	SAC1	SAC2	SAC3-4
Access	2	4	4
Care planning	5	3	5
Communication	24	16	45
Environment	0	1	0
Equipment	3	0	7
Policy & Guidelines	21	13	26
Risk management	3	3	11
Supervision	5	4	4
Teamwork	1	0	0
Transfer-related*	0	3	0
Workforce	12	3	21

*Transfer-related includes issues around preparation for and/or delays in transferring a mother and/or baby.

Good communication is fundamental to optimal care of pregnant women, regardless of which model of care being accessed. Communication was the most frequently cited system factor in all the incidents reviewed, including the RCA reports. Fifty per cent of the communication issues identified in RCAs related to inadequate verbal communication between care providers, 42 per cent to documentation and the remaining eight per cent related to inadequate information/education being provided to the pregnant woman. Case 2, is an example of where incomplete communication of critical information between team members may have impacted on clinical care.

Other RCAs reflected situations where poor communication between providers resulted in fragmented uncoordinated care. One case demonstrated a situation where a reliance on locum obstetricians and an inadequate handover process resulted in a woman with a high risk pregnancy being managed under a medical model of care without the involvement of midwives.

Policy and guidelines are also identified very frequently in RCA reports. The majority related to the failure to apply policy and/or issues around the implementation process. In three reports there were indications that policy was not in line with expected best practice or State directives. In the SAC2-4 incidents, policy and guideline issues included non-compliance with fetal monitoring requirements and escalation processes.

Workforce issues were mainly around skill mix, education and training, availability of senior staff and the locum workforce.

The following incidents reflect many of the system factors identified in the above data.

CASE 4:

Policy and procedures – knowledge/adherence

A woman was admitted with ruptured membranes, but was not in labour. A syntocinon infusion was commenced the next day. CTG was not applied at this time, nor when the syntocinon was increased (when continuous CTG monitoring is required by protocol). Meconium stained liquor was evident at the time of augmentation. When the CTG was applied four hours after augmentation the fetal heart rate was found to be 60 BPM. Delivery was expedited. A severely compromised baby was delivered.

Issue identified:

1. There was a failure to apply and/or adhere to policy related to CTG monitoring during augmentation of labour. Continuous CTG monitoring may have enabled the early signs of fetal distress to be detected.

CASE 5:

Supervision and escalation

A woman was admitted with ruptured membranes. An initial CTG showed tachycardia of >160 beats/minute.

The CTG was removed. The RMO was notified of the tachycardia by a student, but neither the woman nor the CTG was reviewed. There was no change in the management plan. Documentation reflects that the tachycardia persisted. The senior midwife was not aware of the problem. When reviewed at the change of shift and the CTG applied, decelerations were noted. The baby was delivered one hour later. The baby had a low Apgar at 1 and 5 minutes and spontaneous respirations was not established for 10 minutes. The on-call obstetrician was not notified of a problem until after the woman delivered.

Issues identified:

1. There was a failure to recognise and/or respond to abnormal observations.
2. Supervision of the midwifery student was inadequate.
3. There was a failure to escalate the clinical problem.
4. Communication between care providers, including the senior clinician on-call was inadequate.

CASE 6:**Policy and guidelines and skill mix**

A woman with a history of gestational hypertension at 39+6 weeks gestation was reviewed in the antenatal clinic. She gave a history of reduced fetal movement in the preceding two days. A CTG was assessed as reassuring. She again presented at 40+6 weeks with reduced fetal movement and again the CTG was assessed as reassuring. She was booked for induction of labour in three days. The woman presented to the birthing unit the next day in early labour. On admission, her blood pressure was 140/90, FHR 144 and urinalysis showed no abnormalities. Soon after, one of the two midwives in the birthing unit was required to accompany another woman undergoing a C-Section. This left one midwife to care for three women in labour, for over two hours. The RCA found that staffing/skill mix issues in the maternity unit deterred the birthing unit from seeking additional staff.

The next recorded observations, two hours after admission identified the FHR as 80. This was confirmed by Doppler. Twenty minutes later a CTG was applied. The trace was not reassuring. The medical officer was called to assess the woman and a scalp clip was applied. No liquor was seen. An emergency caesarean was undertaken 45 minutes later.

Issues identified by the RCA team include the following:

1. Ultrasound investigation of fetal growth, amniotic fluid volume and umbilical artery flow in the presence of gestational hypertension was not part of the facility's specific guidelines and therefore not done routinely.
2. There are no guidelines at the facility for the assessment and management of decreased fetal movements.
3. The woman with a blood pressure of 140/90 met the criteria for admission to the birthing unit and for CTG monitoring.
4. Regular fetal auscultation did not occur in the absence of continuous CTG monitoring.
5. The paediatrician was not called until after the baby was born.
6. There was insufficient staff to manage the number of labouring women.

During the review of the RCA report the committee also identified workforce issues, including rostering, availability of senior staff and clinical supervision as system factors.

Several RCAs highlighted cases where an incorrect interpretation of the CTG trace by less skilled personnel (medical and midwifery) resulted in a delayed or inadequate response to pathological CTGs. The reports also identified an underutilisation of the escalation processes when concerns were not being addressed.

Human factors which may have contributed to incidents

This category reflects the behaviours, interactions, lapses and other human factors where they can be identified. Retrospective investigations, such as incident reviews and RCAs, are not always able to identify how the interaction between people and complex health systems may have contributed to actions, decisions and ultimately, incidents. There is generally inadequate information in IIMS notifications to determine the presence and/or influence of such factors. Consequently, the information in Table 8 relates to RCA reports only.

Table 8: Human Factors identified in the 29 RCAs reviewed

Human Factor	Description	Count
Cognitive error	Failure to understand/synthesize/act appropriately on available information, including following wrong clinical pathway or not seeking appropriate assistance Mindset/narrow thinking or confined to rule-based thinking	15
Skill-based error	Errors of omission or commission during diagnosis, planning, treatment or general care, due to the operator not completing a particular task in line with his/her attained skill Lapse of attention or memory	4

Patient factors

When reviewing RCA reports, it is sometimes possible to identify patient factors which may have a bearing on what happened, as these sometimes increase the level of risk during pregnancy, labour and/or delivery. The patient factors identified in the RCAs reviewed are shown in Table 9.

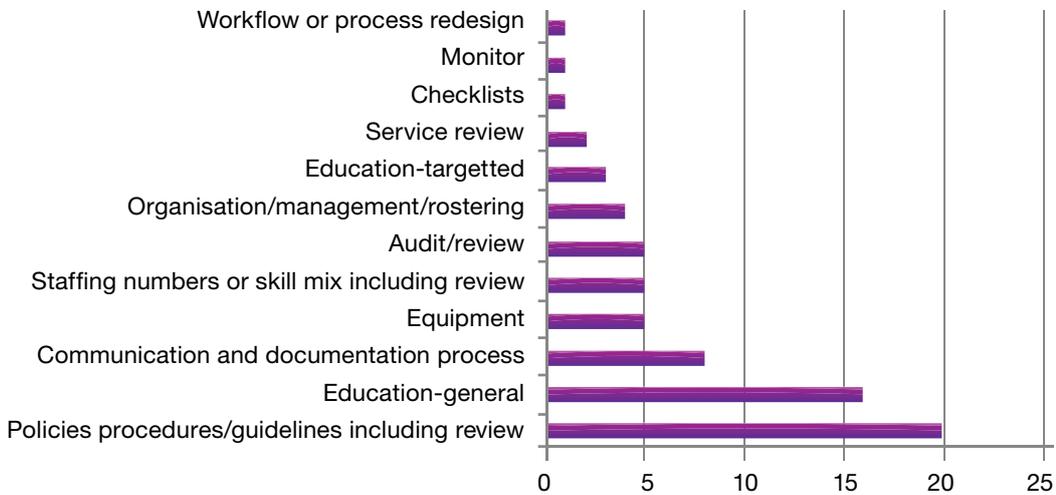
Table 9: Patient factors

Patient Factor	Count
Comorbidities	2
Bariatric Patient	3
Non compliant with recommended treatment	2

Recommendations made by RCA Teams

RCA teams investigating incidents are required to consider how to prevent a similar incident occurring again and make recommendations if appropriate. As shown in Figure 1, development or review of policy and provision of education are common recommendations in RCA reports. Four RCA reports had no recommendations. Further detail about the recommendations can be found in Appendix A.

Figure 1: Recommendations made by RCA teams



Additional Information about SAC2 - 4 Incidents

This level of analysis was limited by the varying amount of information contained in the IIMS notifications. Information in the IIMS notifications, including manager’s reviews, often reflects the immediate clinical management of the patient at the time of the incident, rather than analysis of contributing factors. A number of incidents had no information about review of the incident. Some however, reflect a thoughtful investigation of the incident with clear identification of the system failures and most importantly, possible solutions.

Staff notifying incidents in IIMS are also asked to indicate what they believed was the problem. This is not a mandatory field and is not always recorded. It adds to the overall information and has been included below. It should be noted that in many instances, there was insufficient detail in the free text fields to verify why the notify selected the categories shown in the table below.

Table 10: Problem identified by notifiers of SAC2-4 incidents

Primary problem identified by notifier (where indicated)	SAC2	SAC3-4
Complication	8	8
Treatment	6	21
Diagnosis	2	6
Inter-hospital transfer/retrieval	2	2
Monitoring/observations	2	22
Investigations	1	0
Transfer of care	1	4

Many incidents occurring in maternity units are viewed as complications. While this may be true, what is important is whether the risk of complication was identified, what risk minimisation strategies were in place to reduce the likelihood and/or impact of the complication and was treatment appropriate once the complication occurred.

Conclusion

Clinicians constantly need to find a balance between normalising pregnancy and delivery and keeping the mother and her fetus safe. Literature supports the view that fetal surveillance is a high-risk element of obstetric and midwifery care. Policy and guidelines provide a structure for what is the acceptable level of fetal surveillance during pregnancy and labour. These are based on the premise that clinicians have the appropriate level of skills to interpret what can be subtle changes in the maternal and/or the fetal condition particularly during labour and delivery. This may be a false premise and therefore strategies to reduce the impact of less skilful fetal surveillance must be accommodated.

Issues

Based on the findings of the review the following issues are evident:

1. There may be lack of recognition that fetal heart rate pattern (continuous or intermittent) interpretation must take into account the clinical circumstances. An over-reliance on FHR pattern interpretation **only**, may result in inappropriate management.
2. The availability/or use of fetal blood sampling to determine fetal condition, when fetal monitoring is not reassuring/suspicious is variable.
3. While fetal blood sampling can direct definitive management, compliance with policy and guidelines related to fetal blood sampling is not monitored.
4. While policies and guidelines are available, they may not be effectively implemented, well known/available/workable in all environments and therefore not applied.
5. LHDs appear to commit significant resources to developing/reviewing policies related to NSW Health policy directives. This can lead to policies being modified to fit with local capacity, rather than the expected practice.
6. Although CTG interpretation is a well known area of risk, contingencies to manage the risk are not always clearly articulated.
7. The consequences of inadequate communication between providers and teams are not always fully appreciated in the provision of obstetric/midwifery care.
8. Barriers to escalation of concerns may not be fully understood or may be personality-driven.
9. There may be no clear processes to facilitate skills assessment/credentialing of locum and agency staff. The level of point-of-care supervision for less experienced staff may be a factor of concern.
10. Maintenance of skills in low activity facilities poses significant risk to women and staff alike.
11. Standardisation of documentation and processes for shared care including credentialing is not consistent across NSW.
12. Increasing activity does not always equate to a review of rostering practices.

Considerations/recommendations

1. Establish benchmarks and audit processes to monitor compliance with policy directives and guidelines related to fetal blood sampling where available. This must include the development of a standardised audit sheet for use across the State.
2. Continue the curriculum review and ongoing implementation of the FONT education program. This needs to consider/enhance the program to include:
 - » More emphasis on the clinical context in which CTG interpretation is occurring
 - » More emphasis on physiology
 - » More emphasis on monitoring in management of multiple pregnancies/fetal arrhythmias
 - » Adaptation of educational approaches to accommodate both rural and tertiary level educational needs, models of care, culture and workforce.
3. Maternity services monitor the uptake of mandated education by maternity/obstetric clinicians with regard to fetal surveillance, in line with PD2010_040.
4. LHDs strengthen processes to ensure locum and agency staff employed in obstetrics/midwifery have the required skills/education certification.
5. Obstetric/midwifery services must mandate the requirement to invoke escalation processes to senior clinicians/management when issues/concerns arise.
6. Develop State wide standards/processes for shared care including credentialing and documentation standards.
7. Develop strategies to enable skills enhancement/maintenance in low activity services.
8. Review policy and guideline implementation processes to ensure maximum compliance.
9. All maternity services must have guidelines for point-of-care supervision by on-call clinicians. They should be clear to both the on-call clinician and to the staff on duty. Unit managers must ensure that both senior and junior staff share a common understanding of the guidelines.
10. Establish processes within all maternity services, which includes a person responsible, to facilitate case reviews in dedicated time. These should be multidisciplinary and include both normal and pathological CTGs where intervention may have occurred unnecessarily or intervention did not occur when warranted.
11. Enhance the confidence of maternity staff confidence to escalate concerns through the provision of graded assertiveness training.

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APPENDIX A

Recommendations made by RCA teams

The recommendations made by the RCA teams have been further analysed, summarised and grouped by sub-category. As described in the report, the sub-categories include:

- Care processes
- Fetal surveillance related
- Handover
- Escalation
- Communication/documentation
- Staffing/rostering.

Care Processes

1. Review and update the protocol for syntocinon and implement the updated protocol across the local health district.
2. All women identified as at risk will have a risk identification and treatment plan documented. The treatment plan must include:
 - » Identified risks
 - » Investigations undertaken
 - » Contemporaneous documentation of the management of the woman
 - » A named midwife to be involved in their antenatal planning and care.
3. All clinical staff are to be informed of women at risk and of their current treatment plan. An audit is to be conducted of ten medical records of high risk women to determine compliance with the risk identification and treatment plan. The audit results to be tabled at the base hospital's quality meeting.
4. Management of gestational hypertension to be discussed at the appropriate forum (O&G services meeting) to determine if a guideline should be developed or Society of Obstetric Medicine Aust & NZ (SOMAZ) guidelines utilized.
5. The clinical guidelines "Management of pre-labour ruptured membranes at term" to be reviewed and amended to clarify management of suspected rupture of membranes.
6. All clinical assessments, including CTG interpretation, must be undertaken in the presence of the woman and the outcomes recorded contemporaneously with the provision of treatment in her medical records as required by the Health Practitioner Regulation (New South Wales) Regulation 2010.
7. The labour ward policies and procedure regarding the presence of a paediatrician at delivery are to be updated to include: provision for the clinical decision to deliver the baby in the absence of the paediatric team if it is deemed in the best interest of the baby (e.g. fetal bradycardia). Once the policy is updated the following will occur:
 - » The updated policy and procedure is to be tabled at the hospital quality meeting for discussion and endorsement
 - » Relevant clinicians (midwifery and medical) will be brought up-to-date on the expected procedure
 - » Evidence of staff education on the updated procedure is to be tabled at the hospital quality meeting.

8. Consider implementing an ongoing process to check and track staff's competence in neonatal resuscitation (including managing equipment and the resuscitation cot).
9. Orientation of midwives to the birthing unit to include education about the telephone consultation flowchart and history-taking. A copy of antenatal and intrapartum clinical telephone consultation policy and a laminated flow chart must be displayed in close proximity to areas where staff take telephone consultations
10. The maternity service must ensure that a robust system is in place for ensuring adequate management of a neonatal emergency
11. Investigate the feasibility of implementing the continuity of maternity care model for implementation at the hospital.
12. The maternity unit provide a forum to discuss all recent SAC1 & 2 incidents and offer suggestions on providing precision care with minimal adverse complications. This can be in the form of an M&M meeting providing that more than 80 percent of the birth suite midwives attend with consultant and registrar representation.
13. Case studies to be used as an educational tool for clinicians to raise awareness about the importance of the correct language and terminology used in an emergency.

Fetal surveillance related

14. Review of fetal surveillance CTG guidelines for the inclusion of gestational hypertension as a condition requiring CTG monitoring.
15. Maternity services review the guidelines for intermittent FHR auscultation including requirements, definitions of the latent and active stages of the first stage of labour. Consider that anyone admitted to the birth suite should have regular FHR auscultation regardless of whether they are in early (latent) or established labour.
16. Introduce a documentation convention using a standardised adhesive label in medical records for half hourly documentation and analysis of fetal surveillance/CTG by the midwife. This label has appropriate prompts (as currently used at some facilities within the LHD) and soon to be finalised by the Ministry for Health. (Also refer to Fetal welfare Obstetric emergency Neonatal resuscitation Training (FONT) guidelines).
17. Review LHDs procedure for the management of normal labour across the area to include further requirement of FHR surveillance when FHR remain fixed over consecutive readings.
18. The mandatory policy directive 2010_040-Maternity-fetal heart monitoring assessment ¹ and reporting requirements be implemented as a matter of urgency for midwifery staff. File audit of compliance with PD 2010_040 be conducted for one month and a report provided to the Director, Clinical Governance of LHD that includes recommendations for improvements as identified.
19. The reading, interpretation and documentation of CTG recordings needs to be as precise and consistent as possible. Reading will be done according to the DR C BRAVADO mnemonic (Define Risk, Contractions, Baseline Rate, Variability, Accelerations, Decelerations, Overall assessment). Interpretation will be done according to the Royal College of Obstetricians and Gynaecologists' guidelines for CTG monitoring. Documentation of CTG interpretation will be noted in the medical record using the CTG report sticker as recommended by the NSW Health Policy Directive and the 2010_040 Maternity-Fetal Heart Rate Monitoring and the LHD Clinical Practice Guidelines-CTG Intrapartum 2009
20. CTG competencies of all staff working in birth suite are to be reviewed to identify any staff not up-to-date with mandatory CTG training and complete all outstanding necessary training as a matter of urgency.

21. Fetal welfare education to be completed as directed in PD 2010_040-Maternity-Fetal Heart Rate Monitoring for O&G and midwifery staff. All medical O&G staff must have completed K2Medical Systems fetal surveillance training program and FONT within one week of start of contract. If practicable locum staff must complete the training or provide evidence of completion, prior to starting clinical duties (at orientation).
22. All clinical agency midwifery staff must be allocated time to complete K2MS during orientation to the unit.
23. An audit of compliance with educational assessment programs for CTG interpretation should be implemented to ensure adequate training for medical officers and midwifery staff.
24. All GP obstetricians, midwives and student midwives to have completed mandated education, as required in PD 2010-040 Maternity-Fetal Heart Rate Monitoring
25. The midwife escorting a woman to OT for an emergency delivery must remain with the woman and maintain regular recording of the FHR trace until delivery is imminent. A delivery pack must be immediately available. Any assistance required for retrieval of equipment from outside OT must be sought from the team leader of the birth unit

Handover

26. A process is to be implemented that meets the requirements of PD2009_060 Clinical Handover-Standard Key Principles ²for handover of all women at risk to locum O& G consultants. An audit to be conducted of 10 medical records to determine compliance with the handover process. Audit results to be tabled at the quality, safety and risk committee meeting.
27. Develop a process which ensures that information received from telephone consultations is handed over during shift changes (this could include adding/writing to the white board e.g. to come-in or at-home issues).
28. Implement NSW Health draft "Improving JMO Clinical Handover" guideline toolkit at all shift changes in the maternity unit.
29. Review clinical review and handover practices to ensure that clinical assessment and handover is undertaken in the presence of the woman as supported by the local health district clinical handover policy.
30. Implement ISBAR for all verbal clinical handovers.
31. Implement structured multidisciplinary clinical handover at 0800 and 2000hrs.

Escalation processes

32. O&G medical and midwifery must be educated on the escalation plan. This is to be included in the orientation program for new staff (medical and midwifery).
33. 33 Review of the uniformity of supervision and escalation to senior staff responsible for the patient (registrar/consultant), when there are any concerns.
34. Review the local escalation plan to ensure that students (midwives/medical) are not left unsupervised in the birthing unit. The revised escalation plan is circulated to all maternity care providers locally.
35. 35 The maternal and perinatal division investigate and implement if appropriate a technological-based system for the timely escalation of an emergency in the birthing suite.

Communication/documentation

36. All local maternity care providers are educated regarding the Health Practitioner Regulation (New South Wales) Regulation 2010 documentation standards. .
37. An audit of medical officers' documentation to be conducted.
38. Provide feedback to birthing unit staff about the importance of contemporaneous record-keeping, using an RCA as a case study.
39. Terminology and documentation to be consistent with FONT guidelines. Medical record audit is to be conducted to determine compliance.

Staffing/rostering

40. Conduct a review of staffing, including shift patterns that are responsive to activity.
41. Review and amend guidelines for activating on-call staff.
42. Conduct a review of procedures for midwifery and medical staff in O&G. escalating concerns about activity levels.
43. Conduct a review to consider whether current JMO staffing levels after hours are commensurate with activity levels, in reference to benchmarks and recommendations from local and international reviews. Many units operating at this level of activity have three JMOs after hours.
44. A staffing ratio of one midwife to one woman in established labour is required to ensure availability of staff to review patient progress adequately and detect any deterioration in clinical condition.
45. A formal review of the staffing levels in the Maternity Department be conducted and documented. The recommendations should be submitted to the hospital executive. The review should consider patient acuity and peer facilities and their staff levels. Recommendations must include balancing staff skill mix through all shifts to reflect birthing suite activity. Consideration must also be given to ensuring a senior midwife role as clinical support for all units within the M&P Division for all shifts.
46. Management staff from the local operating theatre are to engage with relevant stakeholders (clinical, non-clinical and management) to review on-call theatre protocols to standardise call in procedures and terminology.

APPENDIX B

Opportunities for improvement suggested by RCA teams

Opportunities for improvement are often included in RCA reports. It is not always clear if the implementation of these actually occurs. Closer examination/consideration of these opportunities for improvement suggests that if implemented they may have a greater impact on clinical practice than some recommendations made by the RCA teams in response to the causal or contributing factors in the incident. The opportunities for improvement have been grouped and summarised more broadly than the recommendations.

Service

In consultation with the LHD and facility management ensure that a full review of maternity services including the midwifery training program is undertaken, to provide continuous quality improvement and professional development activities for all maternity care providers.

Model of care including shared care

There was an identified need to formalise antenatal share care arrangements. This should include:

- Education and competency assessment of general practitioner (GP) involved in shared care programs and a standardised accreditation process
- Defined standards for communication between the GP and hospital during the shared care of patients including standardised use of an antenatal card/book
- Guidelines which ensure transfer of care back to hospital care in certain situations
- Resource material to be available to women which informs them of:
 - » Options for antenatal share care. This information should emphasise that the option is only available to those considered to have a low-risk pregnancy
 - » Information about which GPs are accredited with the hospital.

The maternity unit to develop a service business plan in consultation with midwifery and medical staff. The plan to address but is not limited to:

- Developing standardised assessment and bedside handover
- Implementation and compliance for policies and procedures
- Standardisation of care/standing orders
- Ongoing patients safety & quality plan and activities

Policy/Guidelines

The main focus areas are related to development, implementation and updating of policies and guidelines.

Policy/Guideline Development

The following are examples of suggested policy development:

- Procedure for best practice use of CTG monitoring
- Develop integrated comprehensive guidelines for identifying newborn babies at risk of becoming unwell who require monitoring, in conjunction with the new neonatal observation charts and State-wide checklist
- Documentation standards be developed and included in monthly audit process.

Policy/guideline Implementation

The following examples related to policy implementation:

- Develop an implementation plan for the PD_2007_ 25 Stillbirth-Management & Investigation. ³
Evaluate the implementation of the policy
- Maternity departments implement a guideline for the management of decreased fetal movement
- Implement “Between the Flags” strategies including maternal observation chart
- All medical and nursing staff to sign they have read and understood NSW Health policy for medication phone orders (Medication Handling in NSW Health Public Hospitals PD 2007_077 ⁴)
- The procedure for normal labour and birth-low risk be followed, to improve documentation and standardise observations for women in labour.

Policy/guidelines review/update.

The following are examples of review and update of policy and guidelines:

- Update and clarify the procedure for the diagnosis and management of women with gestational diabetes to ensure it reflects best practice
- Refer the clinical guidelines “Management of Pre-labour Ruptured Membranes at term” to the LHD network for their review and to clarify management of suspected rupture of membranes.
- Revise the LHD medication administration & management procedure to reflect NSW health policy PD2007_077 stipulating that a full record of the phone order is to be documented in the patient medical record and countersigned by two staff members.
- Syntocinon policy be revised to include advice on which protocol to use when risk factors are present. The syntocinon policy to include:
 - » Monitoring for signs of uterine hyperstimulation and/or obstructed labour
 - » Requirement for nursing and medical staff to assess and document uterine activity
 - » Whether senior O&G staff should be required to review the partograms when arrest of labour or slow progress in the active first stage of labour is identified.

Education

The following are examples of recommendations related to education:

- Ensure junior paediatric medical staff are given adequate training in paediatric resuscitation
- Graded assertiveness training be provided by the cognitive Institute program or equivalent, to provide structured process for staff when seeking clinical support/supervision
- Education be provided to all maternity staff re notification procedures for emergencies
- Education be provided to all maternity staff re documentation requirements particularly in respect to contemporaneous documentation. Trend reports be analysed to determine effectiveness or education and audits
- Education on the need to ensure all neonatal resuscitations are scribed contemporaneously. Consider a dedicated arrest documentation sheet for all cases where a baby’s condition is poor at birth
- All midwives and medical officers to be involved in a series of audits of patient progress notes and partograms (five each) to determine level of documentation deficits
- Ensure education is provided for all healthcare professionals involved the delivery of a stillborn baby regarding the legislative and reporting processes required
- Repeat education on best practice guidelines for the obesity management of pregnant women

- Develop a standardised education program for medical officers in maternity including completion of FONT training as soon as practical in protected time, completion of K2 training within three months of start
- Educational requirements are to be maintained by birth suite staff as per FONT requirements which highlight the importance of CTG recordings and communication of findings as per PD2010_040 Maternity-Fetal Heart Rate Monitoring
- Staff in birth suite and OT who may be required to care for a potentially compromised infant are to maintain their proficiency in neonatal resuscitation. CME of maternity and CNE of OT collaborate to conduct annual competency of staff in neonatal resuscitation
- For all category 1 caesarean sections sufficient staff proficient in neonatal resuscitation to be made available in OT for initial resuscitation of the newborn
- Ensure all staff have education on the use of CTG machines including mandatory annual assessment of CTG interpretation
- All GP obstetricians to complete mandated education as required by PD 2010_040 Maternity-Fetal Heart Rate Monitoring
- Determine the feasibility for use of ultrasound during labour including :
 - » Identify appropriate courses for medical staff
 - » Identify appropriate courses for midwives
 - » Staff attendance at courses
 - » Ongoing credentialing.

Equipment

All CTG monitors to be reviewed:

- To ensure biomedical checks are conducted
- To determine which can be utilised for maternal heart rate monitoring
- Maternity department review the availability of CTG machines and consider whether more are needed
- Review of oxygen and medical gases connection to the resuscitation cot and appropriately action
- The resuscitation be equipped with both Laerdal and neopuff infant resuscitators according to NSW Health PD 2008_27 Maternity-Clinical Care and Resuscitation of the Newborn Infant ⁵.
- A review of the birthing unit telemetry system is recommended. Suggest a business case be prepared for submission if upgrade or enhancement of the telemetry systems is identified as essential for service delivery.



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