Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Midland Hospital Portlaoise

Systems Analysis Review Report

Strictly Private and Confidential

Incident Review Title:	Review of Care of Shauna Keyes
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Incident Number:	50577
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Review Report Date:	**2nd November 2015**

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Introduction

At the outset of this report, the Review Team would like to acknowledge the level of distress caused to Shauna, Joseph and their families in relation to both the circumstances relating to the death of baby Joshua and also the prolonged nature of the process which has led to the conduct of this review. Shauna is a remarkable woman who whilst persisting with her quest for answers and explanation in relation to her care has also placed considerable effort in relation to supporting the care of women who experience neonatal death and must be commended for this. We would hope that this report can provide Shauna, Joseph and their families with an explanation of what happened, why it happened and what needs to change in order to reduce the risk of a similar outcome in the future.

Whilst every effort is made to deliver high quality safe services there are times when the outcome of care falls below that which was anticipated. In such circumstances it is the policy of the HSE to carry out a review of the circumstances of the incident so that we can understand and explain to service users and their families what went wrong, why it went wrong and what will be changed to ensure that we minimize the risk of a similar event occurring in the future. Fundamental to the whole process is ongoing open and honest communication with those affected– service users, employees and others.

The Review Team would also like to acknowledge the level of cooperation received from the management and staff at the Midland Regional Hospital Portlaoise (MRHP) in the conduct of the review. Throughout our engagement with them we were impressed by both the high level of openness and commitment made to the process itself and to the implementation of any recommendations that may be made as a consequence of this review.

Executive Summary

This is the report of an independent review in relation to the care of Shauna Keyes and her baby Joshua at the MRHP. It was initially commissioned by Mr David Walsh, Regional Director of Performance and Integration, HSE Dublin Mid-Leinster in response to a request by Shauna and her partner Joseph Cornally for a review of Shauna's Care. This request was made following a Prime Time Investigates programme into issues relating to infant deaths in the MRHP. In accordance with changes to the establishment of Hospital Groups the role of the commissioner transferred to Dr Susan O'Reilly CEO of the Dublin Midlands Hospital Group, the Hospital Group to which MRHP is now aligned.

Shauna, a first time mother was referred to the Antenatal Services at the MRHP by her GP when she was 18 weeks pregnant and was seen at the antenatal booking clinic when she was 25 weeks pregnant. Shauna had 4 admissions antenatally, at 22, 28, 33 and 38 weeks respectively. The first of these admissions occurred prior to her antenatal booking visit.

On the 27th October 2009 at 06.30hrs she was admitted to MRHP via ambulance with a history of spontaneously ruptured membranes and contracting since 03.00hrs. She was assessed and was found to be in early labour. The CTG showed a reactive trace with a baseline of 140bpm and no decelerations i.e. a normal CTG. At 14.30hrs a Syntocinon drip 10iu/1L was prescribed to augment her labour. At 16.00hrs an epidural was sited at Shauna's request and the Syntocinon drip was commenced at 30ml/hr.

At 17.00hrs the Syntocinon drip was increased to 90ml/hr and decelerations were noted on the CTG, the Syntocinon drip was stopped and the Obstetric Registrar was contacted who advised that if decelerations continue to inform the Obstetric Consultant. The decelerations did not continue and following discussion with the Obstetric Consultant on call the Syntocinon was recommenced at 10ml/hr and to increase by 10ml/hr every 10 minutes[1]. At 21.30 early decelerations were noted and by 22.50 Shauna was fully dilated with blood stained liquor. At 23.20 Shauna was reviewed by the Obstetric Registrar, decelerations were noted on the CTG with good variability and a decision was taken to reduce the Syntocinon to 120ml/hr (from 170ml/hr). At 23.45 Shauna was again

[1] The protocol in place at the time of the event identified that the maximum rate of infusion of oxytocin was 180mls/hr (see Appendix 4)

reviewed by the Obstetric Registrar, decelerations were noted and her cervix was unchanged on examination. The Obstetric Registrar discussed Shauna's care with the Consultant on Call and a decision was made for delivery in theatre by caesarean section.

Baby Joshua was born at 00.36 with a heart rate of 60bpm, the baby showed no respiratory effort, no muscle tone, no reflex irritability and poor colour. The APGAR score was one at 1 minute. The Paediatric SHO commenced resuscitation with the Paediatric Registrar attending at 3 minutes of life. At 5 minutes there was no heart beat, no respiration, no muscle tone, no reflex irritability and poor colour. The APGAR score was 0 at 5 minutes. An endo-tracheal (ET) tube was sited at 7 minutes but the APGAR score was still 0 at 10 minutes. The Consultant Paediatrician arrived at 00.55hrs and following assessment found that the heart rate was 100bpm and oxygen saturations were >80%. Two doses of adrenaline were given via the ET tube and the baby was transferred to the Special Care Baby Unit (SCBU) at 35 minutes of age. Intraosseous adrenaline was given in SCBU but at 55 minutes of age with no response to treatment, resuscitation was discontinued and baby Joshua was pronounced dead and Shauna and Joseph were informed.

Shauna at her request was initially cared for in a private room on the Medical Ward and transferred back to the Maternity Unit later that day. In the morning she was seen by the Consultant Obstetrician and she and Joseph had an opportunity to be with baby Joshua prior to the post mortem. Funeral arrangements were discussed with Shauna, mementos of the baby provided and she was referred to the Psychiatric Consultation Liaison Nurse who arranged for a mental health discharge plan. Referral was also made to the Public Health Nurse prior to Shauna's discharge on the 30th October 2009.

The Consultant Paediatrician received the draft post mortem report on 21/12/09 and along with the Consultant Obstetrician met to discuss this with Shauna and Joseph on the 05/01/10. It was at this meeting that Shauna raised issues in relation to the care that she had received in the period following Joshua's death. These issues related to access to Joshua and time spent with him, the appropriateness of the coffin used, the incompleteness of the mementos provided and a lack of compassion exhibited by staff. Staff present acknowledged the level distress being experienced by Shauna as a

consequence of events relating to her care and details of access to counselling and bereavement information were provided.

Shauna also expressed in her meeting with the Review Team, concerns in relation to her perception that there was reluctance on behalf of the coroner to hold an inquest.

This review examined four key areas of Shauna's care, the management of her labour, the caesarean section, the resuscitation of Joshua and the care and support provided to Shauna following Joshua's death.

Key areas of concern related to the interpretation of the CTG, the absence of foetal blood sampling, the delay in delivering Joshua, the absence of a formal bereavement service and a lack of support for relatives in relation to the coronial process.

A total of 23 recommendations have been made by the Review Team and given the distance of time between the events in 2009 and the completion of this review, the hospital have provided a response to these recommendations to reflect changes that have been since introduced in MRHP.

Background

In 2009 the Midland Regional Hospital Portlaoise was a 200-bed general hospital servicing the catchment areas of Laois, Offaly, Kildare, Carlow and Tipperary with in-patient, day case, emergency and outpatient services. In 2009 the obstetric and gynaecology department provided a consultant-led service that was responsible for 2273 births.

The obstetric and gynaecology department was situated on the second floor of the hospital and consisted of a combined 30 bed in-patient ward, an assessment unit with three individual rooms, three labour rooms and a 6 bed special care baby unit with its own dedicated staff. The theatre used for caesarean sections was situated on the first floor i.e. the floor below the obstetrics/gynaecology department.

The department was staffed by 3 Consultant Obstetrician/Gynaecologists and the daily roster of midwifery staffing consisted of one CNM2, seven Midwives (5 Senior and 2 Junior) and one Healthcare Assistant (HCA) on day duty (08.00hrs – 20.30hrs) and by five Senior Midwives and one HCA night duty. This midwifery staffing was for the entire unit including the labour ward i.e. the wards were not separately staffed.

At the time of Joshua's death in 2009, the HSE Incident Management Policy (2008) pertained. This required that *"all incidents shall be identified, reported, communicated and investigated"*. The HSE Dublin Mid Leinster (Midlands Area) also had in place a guideline at this time for Complaints and Incident Management and Investigation. This guideline was in line with the HSE Policy and outlined the process to be applied in relation to the reporting and investigation of incidents. It outlined that the investigation should *"commence as soon as possible after the complaint/ incident event has occurred"*

Despite baby Joshua's death being identified as an incident and formally reported there is no evidence that the incident was the subject of a formal review process as was required by the HSE policy and regional guideline.

Subsequent to this incident however, at the request of the National Hospitals Office's, Quality and Patient Directorate, a review was commissioned in 2010 in relation to the

whether the practice of a midwife in the Unit was in line with best practice or sub-optimal and if referral to An Bord Altranais was required.

As part of this review three cases were considered, one of which was the case of Shauna Keyes. This review did identify issues in relation to the care of Shauna and the other two women and made a series of recommendations in relation to the individual midwife and the unit in general. Though commissioned in March 2010 the report was not finalized until February 2012. The review undertaken did not constitute a systems analysis and did not include involvement of Shauna or the other mothers; indeed Shauna was unaware at that time that the report had been commissioned.

Shauna became aware of other concerns being raised in relation to the Maternity Service in Portlaoise and consequently requested a formal review of her care to be carried out. This report is the outcome of that review.

Terms of Reference

The terms of reference were developed in accordance with HSE Policy and agreed with the Royal College of Physicians in Ireland. Full detail of these can be found at Appendix 1 of this report.

Abbreviations used in the Report

Ant	Anterior
ANC	Ante-Natal Clinic
BMI	Body Mass Index
BP	Blood Pressure
BPD	Bi-parietal diameter a measurement of the baby's skull taken from the outer edge of the nearer parietal bone to the inner edge of the more distant parietal bone. Used as one of the measures for calculating fetal growth
BPM	Beats Per Minute
CMHT	Community Mental Health Team
c/o	Complaining of
CNM3	Clinical Nurse Manager 3
CPR	Cardio Pulmonary Resuscitation
CR	Capillary Refill
C/S	Caesarean Section
CTG	Cardiotocography (CTG) is a technical means of recording (-*graphy*) the baby's heartbeat (*cardio*-) and the contractions of the uterus (-*toco*-) during pregnancy
Cx	Cervix
D/C	Discharge
DPAR	Drug Prescription and Administration Record
D/W	Discussed with
EDD	Estimated Date of Delivery
ET/ETT	Endo Tracheal/ Endo Tracheal Tube
FH	Fetal Heart
FHR	Fetal Heart Rate
FID	Fetal Interuterine Death
FM	Fetal Movements
FMF	Fetal Movements Felt
FTA	Failure to Advance
GP	General Practitioner
HVS	High Vaginal Swab
IPPB	Intermittent Positive Pressure Breathing
IO	Intraosseous
IV	Intra Venous
LSCS	Lower Segment Caesarean Section
Lt	Left
LW	Labour Ward
MMR	Measles Mumps Rubella (vaccination)
MW	Midwife
NAD	No Abnormality Detected
NBO	No Bowel Open
NND	Neonatal Death
NR	Non Reassuring (refers to CTG)
O/E	On Examination
OFC	occipital frontal circumference
O/P	Occiput Posterior (head down, facing your front);
OPD	Out Patients Department

OT	Operating Theatre
P	Pulse
PEEP	Positive End Expiratory Pressure
PM	Per Minute
PM	Post Mortem
PO	per os – used to describe when medication is to be taken orally or by mouth
PR	Per Rectum
PROM	Premature Rupture of Membranes
PU	Passed Urine
PV	Per Vagina
S/B	Seen by
SCBU	Special Care Baby Unit
SHO	Senior House Officer
SRM	Spontaneous Rupture of Membranes
SROM	Spontaneous Rupture of Membranes
T	Temperature
TAS	Trans-abdominal sonograph (ultrasound)
TDS	ter die sumendum – frequency of a drug dose being three times a day
TEDs	Refers to TED anti embolitic stockings
T/F	Transferred
U/C	Urinary Catheter
U/S	Ultrasound
UVC	Umbilical Venous Catheter
VE	Vaginal Examination
Vx	Vertex

Methodology

Following establishment of the terms of reference and the appointment of the Review Team, the Team were provided with Shauna and Joshua's clinical records and documentation relating to the coronial process.

The Review Team engaged in a detailed meeting with Shauna and her advocate from Patient Focus on the 7th May 2014. This meeting enabled the Review Team to introduce themselves to Shauna and to devote time to listen in detail to her perspective in relation to the care received in Portlaoise. This provided the Review Team with a clear understanding of the issues Shauna wished to see addressed by the review process and facilitated the Review Team with an opportunity to outline the review process and to answer any questions that Shauna and her advocate had.

Requests to the hospital for further information were also made to include contextual information about the service in place at the time of Shauna's pregnancy and labour. A full listing of the information requested is outlined below.

Having considered the time lapse between the incident in 2009 and the review commencing in 2014 the Review Team were aware that a number of key staff on duty at the time of the incident were now retired and of those still in service that a review focused solely on their recollections may distort rather than add to the analysis. The Review Team were also aware from Shauna that apart from the review assisting her understanding of what happened and why that it should identify those things that needed to change in order to ensure that lessons were learnt and any improvements identified as required were made.

The Review Team were also aware from its visits to Portlaoise that there was a significant change programme in place in relation to many of the aspects of the service. Therefore, whilst the recommendations made by the Review Team would relate to the situation at the time the incident occurred i.e. 2009, the team also wanted to provide an opportunity for the service to respond to the recommendations made to allow them to outline the extent to which these had been, or were being addressed. This was seen as

important from the perspective and confidence of both Shauna and other mothers and also to acknowledge the work and commitment of the current staff in Portlaoise.

The proposal for the conduct of the Review was outlined to Shauna and staff in the hospital therefore attempted to marry these elements and to conduct the process in a manner which both provides Shauna and Joseph with the answers they seek whilst being future focused on improvement and learning.

Given that the success of this approach relied on creating an open and honest dialogue to gain the perspectives of all relevant staff, it was agreed to host two briefing meetings with staff to ensure that they understood the planned approach and its objectives and to address any queries they might have.

The meetings were multidisciplinary and held on the 21st May 2014. The first took place at the monthly Obstetrics/Gynaecology Mortality and Morbidity Meeting at which approximately 30 staff attended from a variety of specialty groups e.g. obstetrics and gynecology, paediatrics, anaesthetics, midwifery and nursing. The second meeting was attended by approximately 20 midwifery staff of all grades and was held in the Obstetrics/Gynaecology Department. Both briefing meetings were well received and staff engaged in active debate around the planned process i.e. the detail of the case was not the subject of discussion at this stage.

The Review Team were impressed by the number of staff who came in off-duty to attend these meetings, the level of engagement at the meetings and the desire of staff to review the case to assist with Shauna's understanding of the incident and identify changes that may be required to improve the delivery of the service to the women of attending the service.

From the perspective of the Review Team, these meetings provided a strong basis for the subsequent hosting of the multidisciplinary team (MDT) case review.

Subsequent to these meetings a date was agreed with the Maternity Management Team for the hosting of the MDT case review and a letter was issued by the Review Team inviting staff to participate. The Lead Consultant and Director of Midwifery Services

agreed to ensure that the attendance at the MDT meeting was of a manageable size (12-14 staff) and that there was balanced representation of all staff groups and grades in attendance.

In advance of the MDT case review meeting a chronology of Shauna's care was developed from the available documentation. This was circulated along with contextual information with regard to activity and staffing in the department at the time of the event, a document based on Shauna's perspective of her care, a copy of the guideline for the use of Oxytocin in use at the time of the event and a copy of the draft Induction of Labour policy that was currently in development. Also circulated in advance of the meeting was a document which provided detail of the contributory factors framework which, in line with HSE policy[2], is used to assist with analysis of any key causal factors identified. The MDT case review meeting was held off site from the hospital.

At the meeting Shauna's chronology of care was presented. Staff engaged in clarifying aspects of this and moved then to consideration of issues relating to the delivery of care. Four key areas of care were identified by staff and an analysis in relation to each was carried out. To assist with the framing of recommendations staff also had the opportunity to provide feedback in relation to their perspective in relation to the areas requiring improvement.

Subsequent to the MDT meeting, a meeting was held with the Maternity Quality and Patient Safety Governance Group to discuss both the outcome of the MDT meeting and to focus also on the mechanisms required, from a governance and leadership perspective, to ensure that any recommendations arising from the review are implemented.

A site visit to the Maternity Department, Special Care Baby Unit (there is a new unit there now and it is in a different location than it was at the time of Joshua's birth) and the Theatre was also carried out on the 21st May 2014. At the time of this event the Special Care Baby Unit (SCBU) was located in the labour ward area but was relocated in early

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[2] HSE Safety Incident Management Policy May 2014. http://www.hse.ie/eng/about/Who/qualityandpatientsafety/incidentrisk/Riskmanagement/SafetyIncidentMgtPolicy2014.pdf

2012 to its current location on the first floor below the maternity ward. This move provided a significant improvement on the previous location with more space for clinical care and increased opportunities for confidentiality. To maintain the link with the maternity floor the SCBU nursing staff liaise with the shift leader each morning in relation to potential high risk patients in maternity and bed availability in SCBU. SCBU also have emergency trolleys in the labour ward and theatre should they be required. Maternity staff communicate with SCBU and Paediatric team throughout the day if cases arise in maternity that need SCBU assistance. There is also an emergency bell with light system in place in all areas that will summon SCBU/Paediatric staff in the event of an emergency situation.

Two expert reports were commissioned by the Review Team from the Royal College of Physicians in Ireland to assist with the process, one relating to Shauna's obstetric care was completed by Prof. Fionnuala McAuliffe, Consultant Obstetrician, National Maternity Hospital, Holles Street and one relating to the resuscitation of Joshua completed by Dr. John Murphy, Consultant Neonatologist, National Maternity Hospital, Holles Street.

Following the meetings in Portlaoise and receipt of the expert reports any further clarifications required were sought from staff in Portlaoise or Shauna.

Documentation reviewed as part of the process included the following:

- Clinical Notes – Shauna Keyes
- Clinical Notes – Joshua Keyes
- Activity and staffing levels in the department at the time of the event
- Submission by Shauna Keyes in relation to her perspective of her care and the issues she felt required consideration in the course of the review
- A copy of the guideline for the use of Oxytocin in use at the time of the event
- A copy of the draft Induction of Labour policy currently in development.
- Report of the review into the practice of staff midwife A involving three maternity cases at the Midland Regional Hospital, Portlaoise on specific dates in 2006, 2009 and 2010.
- Statements by staff in preparation for the Coroner's Inquest

- 2005 American Heart Association (AHA) Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) of Pediatric and Neonatal Patients: Pediatric Basic Life Support
- Report of the Coroner
- Post Mortem report of baby Joshua
- Expert Report from Prof. Fionnuala McAuliffe, Consultant Obstetrician (Appendix 2)
- Expert Report from Dr. Murphy, Consultant Neonatologist (Appendix 3)

The Review Team then developed a draft report based on the documentation received and the output of the above meetings. This draft report was then provided to the two clinical experts to ensure that the report accurately reflected their opinions and any changes identified as required were made.

The draft report was then provided to maternity service management with an opportunity for them to include after each of the recommendations an outline the current situation as it related to each of the recommendations. This provided the opportunity for them to reflect the extent to which any of recommendations for change had been made since the incident occurred in 2009. Any gap that existed between the recommendations and current service provision could then become the focus for the development of an action plan.

This draft of the report was also circulated to staff from Portlaoise who were involved in the process and the Coroner for Laois. They were asked to check it for factual accuracy and to provide any comments they wished to make. All factual inaccuracies were corrected and comments made were considered in finalising the report.

Throughout the process the Review Team maintained contact with Shauna in order to provide her with assurance with regard to the progress of the process and to ensure that her ongoing support requirements were being adequately met.

The Review Team then met with Shauna, on 14th October 2015 and detailed discussion took place with her regarding the report and its recommendations.

The Review Team acknowledge that the Hospital have indicated that they would like to meet with Shauna and Joseph following the finalisation of this report, to provide assurance to her that the Hospital has learned and taken actions as a result of this event.

Background to Shauna and her pregnancy

Shauna was 17 yrs old when she became pregnant, she had a partner, Joseph at this time and today she and Joseph are currently planning their wedding. At the time she was living at home with her mother and brother.

Medical History

Shauna had a history of asthma as a child. She was assessed in the Mental Health Services for bipolar disorder but ultimately was diagnosed with a reactive depression. She was on Prosnel for 6 months and stopped it in December 2008 and was on Lamictal from March to May 2009. She had an Implanon contraceptive device in situ but this was removed when she came to know about the pregnancy.

Antenatal admissions

Shauna had 4 admissions antenatally, at 22, 28, 33 and 38 weeks respectively. The first of these admissions occurred prior to her antenatal booking visit. Details of these admissions are outlined below.

25/06/09 (21.30hrs)

Admitted by ambulance to maternity ward. History of lower abdominal pain for last 5 days that was worse today. She had vomited twice and was not feeling baby movements. She had also attended hospital one week previously (18/06/09) was scanned and found to be 21/40 pregnant. The notes from this visit refer to an EDD of the 28/10/09 and the plan was to refer her to the booking clinic.

She had a trans-abdominal ultrasound (TAS) which confirmed the presence of a single active foetus, FH+, FM+, LV normal, placenta fundal and anterior. BPD = 52.17 Discharged on 26/06/09 and referred to booking clinic.

13/07/09 Booking Visit at 25 weeks gestation

08/08/09 Admitted with a history of light PV bleeding. No history passing clots. FMF, no abdominal pain, no other complaints. Vitals stable, CTG reactive, Cervix closed, very light PV bleeding. Admitted for observation Discharged 09/08/09

15/09/09 Admitted complaining of pain under ribs, in spine, lower abdomen and chest. Pain sharp in nature with decreased FM. Vitals normal. O/P fundus equal to dates, long lie with a query breech presentation, tender abdomen on palpation. FM √, CTG commenced, FHR 132. Shauna not in distress and all care explained. Breech presentation confirmed on U/S. Reviewed by Dr. For review in ANC 2/52. CTG reassuring. Impression - left pyelonephritis, gastritis, dehydrated. Admitted for IV Augmentin and PO Nexium. CTG baseline 140, variability 5-10, no decelerations, no uterine activity with FMF. All care explained. 16/09/09 felt well and discharged home on Nexium.

13/10/09 Admitted at 38/40, her clinical notes state that Shauna presented with a gush of fluid x 1, no contractions, no further discharge, comfortable at present, Denies dysuria/frequency.

L/T SNT, Cephalic lie, = dates TAS Single active foetus, LV normal, multiple pockets, Largest = 5.7cm, speculum with consent, no amniotic fluid, Amnicator –ve, Thick white discharge, small amniotic sac, HVS taken. Plan: discharge, return to clinic on 15/10/09, sooner if bleeding/pain or any concern.

Chronology of events

Introduction

The chronology set out below is derived from available documentation which is set out in a time sequenced manner. It is divided into the four main events relating to Shauna's care i.e. her induction and labour, the caesarean section, the resuscitation of Joshua and Shauna's post natal care.

Date	Time	Event
		Chronology relating to Induction and Labour
27/10/09	06.30	Shauna was admitted via ambulance with a history of spontaneously ruptured membranes and contracting since 03.00hrs. On assessment by Midwife A there was clear liquor draining++, O/P long lie, cephalic presentation. 3/5 palpable. CTG commenced. Reactive trace. Baseline 140bpm. +accelerations. ^{0}decels. FMF. Pains 2-3:10 mild. Vaginal examination deferred. B/P 124/84 P98
	07.15	Pains 20-30 secs. 3:10 VE to assess with consent. V+V NAD. Clear liquor draining. Amnicator +ve. Cx thick, posterior Os unable to reach Presenting Part just tipped FH – 135bpm ^{0}Cord, ^{0}placenta. To Ward To bed/mobilise and await events Contracting 3:10 mild regular
	09.45	S/B Dr and assessed. Pain 1:20, SROM 3am, draining clear liquor, Vx 2/5. Plan await event, monitor temp
	11.30	Has mild pains. CTG commenced. FHR 146 T+2 SROM @03.00hrs. No PV loss Baseline 135-140bpm, Variability 5-10 bpm. Acceleration: reactive No decelerations FM no contraction.
	12.00	Draining clear liquor, HVS taken. Plan: await events. Monitor temps
	02.30 (14.30)	For Syntocinon drip 10iu/1L to augment labour
	15.00	T/F to labour ward. c/o contractions 3:10. Very anxious and upset. VE Cx 1cm dilated. Entonox given. Requesting epidural analgesia.

Anaesthetist present on LW. FH 140bpm, SROM 03.00 (12hours)

15.15 FH 139bpm. Clear liquor draining

15.30 FH 146bpm. Clear liquor draining. Using Entonox, Anaesthetist present, to do an epidural.

16.00 Epidural sited by Anaesthetist A. 10iu Syntocinon in 1 litre nacl was commenced at 30mls/hour as instructed. A CTG was also commenced at this time.

16.30 Syntocinon dosage increased to 60mls/hour. Epidural infusing @5mls/hour. BP 117/53 Contractions 2:10 minutes P107bpm. Clear liquor draining, comfortable now. FH 134bpm. CTG reactive with good accelerations. U Catheter inserted and draining clear urine

17.00 Syntocinon dosage increased to 90mls/hour per policy. FH 133bpm. IV Hartmann's infusing. Epidural@ 5ml/hr. Urinary Catheter yielding clear urine. CTG reactive.

17.15 Late decelerations noted since ↑ to 90ml/hr. Good beat to beat variability, clear liquor draining.

17.17 Obs/Gynae Reg A contacted. Syntocinon stopped FH 136bpm.
Obs/Gynae Reg A busy (scrubbed) in theatre. If late decels continue, Consultant Obs/Gynae A is to be contacted.
Midwife A's statement says Consultant Obs/Gynae A contacted

17.35 CTG Interpretation
Baseline fetal heart rate: 140bpm
Baseline variability: 5 -10 bpm
Accelerations x2 in 20mins: Yes
Decelerations: No (Yes initially ticked but this is crossed out)
Type of deceleration (if present): Boxes for Late and Variable ticked in notes
Uterine contractions:
Frequency: 3 in 10 minutes approx
Duration: 45 seconds approx

17.45 Midwife A relieved for break by Midwife B. Midwife B reported in her statement that she covered from 17.45 to 18.15 and during this time the care of Shauna was uneventful. Clinical notes identify CTG: Baseline

130bpm, Variability 5-10 bpm. No accelerations present No decelerations present. Contracting 3:10. Shauna sleeping. The liquor was clear (per MW statement).

18.00 CTG baseline: 128bpm Variability >5bpm. Accelerations present No Decelerations present Contracting 3/10 Moderate Clear liquor on pad.

18.15 Midwife A instructed by Consultant Obs/Gynae A to recommence Syntocinon with a dosage of 10mls/hour and to increase the dosage by 10mls every 10 minutes.
Clinical notes record this as follows 'Spoke to Consultant Obs/Gynae A and Obs/Gynae Reg A, to recommence Syntocinon @ 10mls/hr & increase by 10mls every 10minutes same commenced. FH 147bpm. CTG reactive é good accelerations. IV Hartmann's infusing, u/catheter draining clear urine Clear liquor draining'

18.20 Shauna complained of feeling pressure. On examination it was ascertained that she was 2cm dilated VX-3 Clinical note record this as follows 'c/o feeling pressure in vagina VE to assess Cx 2cm Vx -3 Clear liquor draining, no cord or placenta felt FH 132bpm CTG satisfactory'

18.25 Syntocinon dosage increased to 20mls/hour. Clinical note record this as follows 'Oxytocin ↑ to 20mls/hr FH 133bpm. Remains on Lt Lateral

18.30 Shauna reviewed by Obs/Gynae Reg A who advised to continue plan in place. Clinical note record this as follows 'Back on Syntocinon on 20mls/hr now, CTG reactive ↑ Syntocinon 10ml every 10 min'

18.35 Syntocinon dosage increased to 30mls/hour. Clinical note record this as follows 'Oxytocin ↑ to 30mls/hr. FH 149bpm. Clear liquor draining, IV Hartmann's infusing'

18.45 Syntocinon dosage increased to 40mls/hour Clinical note record this as follows 'Oxytocin ↑ to 40mls/hr. FH 130bpm'

18.55 Syntocinon dosage increased to 50mls/hour
Clinical note record this as follows 'Oxytocin ↑ to 50mls/hr. FH 129bpm'

19.05 Syntocinon dosage increased to 60mls/hour
Clinical note record this as follows 'Oxytocin ↑ to 60mls/hr. FH 142bpm, clear liquor draining SHO Obs/Gynae A contacted Re: bloods (for group

and hold in case required)

19.15 Syntocinon dosage increased to 70mls/hour Clinical note record this as follows 'Oxytocin ↑ to 70mls/hr. FH 140bpm c/o Pain on Lt side, turned onto Lt side Anaesthetic Registrar B contacted for top up will be here in 15 mins (Sticker on this entry PLACE IN PATIENTS CHART P0030659 – this sticker related to blood cross matching)

19.25 Syntocinon dosage increased to 80mls/hour Clinical note record this as follows 'Oxytocin ↑ to 80mls/hr. FH 127bpm. Using gas'

19.35 Shauna feeling pain.
A top up of the epidural was given by the anaesthetist. The Syntocinon dosage was increased to 90mls/hour
Clinical note record this as follows ' Anaesthetic Reg B: Top up epidural é 3mls of 0.25% Chirocaine & 3ml of 2% lignocaine

19.36 BP 147/81 P 107 bpm

19.45 Syntocinon dosage increased to 100mls/hour Clinical note record this as follows 'Oxytocin ↑ to 100mls/hr. FH 122bpm.BP 127/74 Clear liquor. Pain is easing now'

19.55 Syntocinon dosage increased to 110mls/hour Clinical note record this as follows 'Oxytocin ↑ to 110mls/hr. FH 122bpm.BP 127/74 Clear liquor draining IV Hartmann's infusing Epidural infusing @ 10mls/hr U/Cath yielding clear urine. Sleeping @ present'

20.05 Syntocinon dosage increased to 120mls/hour Clinical note record this as follows 'Oxytocin ↑ to 120mls/hr. FH 127bpm'

20.15 Syntocinon dosage increased to 130mls/hour. Shauna was given her first dose of Benzypenicillin by the SHO Obs/Gynae A. The CTG was reassuring since the Syntocinon was recommended.
Clinical note record this as follows 'Oxytocin ↑ to 130mls/hr. FH 129bpm Clear liquor draining. IV Hartmann's infusing Epidural @ 10mls/hr Sleeping at present' SHO Obs/Gynae A called to give 1st dose of Benzypenicillin (PROM) Will come soon'

20.25 Syntocinon dosage increased to 140mls/hour.
Clinical note record this as follows 'Oxytocin ↑ to 140mls/hr. FH 123bpm Clear liquor draining. IV Hartmann's infusing Epidural @ 10mls/hr

remain sleeping'

20.30 Midwife A hands over care to Midwife C on night duty. Shauna appeared sleeping, effective epidural infusing 10mls. Syntocinon 140mls/hour to increase by 10mls every 10 mins. Hartmann's infusing for hydration. Catheter –clear urine. T36[2] FH 150

20.35 Syntocinon infusing 150mls/hour
Clinical note record this as follows ' Synto ↑ 150mls @ 20.35 BP 131/65 P 78'

20.40 Heart rate 130bpm. Baseline variability 126pm. Accelerations x 2 in 20 mins Yes √
Decelerations Yes √
Uterine contractions 4:10
Duration 40-45 secs approx
BP 131/65 P 78
Recorded in Clinical Notes on CTG Interpretation form as follows
CTG Interpretation
Baseline fetal heart rate: 130bpm
Baseline variability: 12 bpm
Accelerations x 2 in 20mins: Yes
Decelerations: Yes
Type of deceleration (if present): No boxes ticked
Uterine contractions:
Frequency: 4 in 10 minutes approx
Duration: 40-45 seconds approx

20.45 Syntocinon dosage increased to 160mls/hour

21.05 Midwife C contacted Obs/Gynae Registrar A on phone and discussed management plan. PV again 12m/n and inform Obs/Gynae Registrar A. Syntocinon dosage increased to 170mls/hour.
The following is recorded on a profoma sheet
Vaginal Examination: Date 27/10/09 Time 21.05hrs
Fetal Heart Rate Prior to Examination: 140bpm
External Genitalia: NAD
Vagina: NAD
Cervix: Thinning (circled)
Effacement: Effacing (circled)
Consistency: Soft (circled)
Application: Close
Dilatation 5-6cms
Presentation: Cephalic (circled)
Relationship to ischial spines -3 (circled)

Position: No recording
Membrane: Ruptured and SRM (circled)
Liquor: Blood Stained (circled)
Fetal Heart Rate Post Examination: 130bpm

21.10 Syntocinon dosage increased to 180mls/hour

21.20 FH early ↓ 110

21.30 FH 142 pains 4:10. Feels pressure using entonox early decels ↓ 110

21.45 FH 135 early decels ↓ 110 quick recovery. Pains 4:10 feels pressure, entonox. A bit nauseated. Epidural ↑ 15mls. BP 112/70 P 82 T 36^4

22.00 Anaesthetist Registrar B informed need epidural syringe Fent and Bupilas

22.10 **CTG Interpretation Form**
Baseline fetal heart rate: 140bpm
Baseline variability: 10 bpm
Accelerations x 2 in 20mins: Yes ticked
Decelerations: No box ticked
Type of deceleration (if present): Early box ticked ↓ 120 quick recovery
Uterine contractions:
Frequency: 4 in 10 minutes approx
Duration: 40 seconds approx

22.15 Epidural infusing 15mls^o

22.25 FH 141 Synto 150mls^o

22.45 FH 150 ↓110 quick recovery feeling pressure.
Epidural 15mls^o

22.50 The following is recorded on a performa sheet
Vaginal Examination: Date 27/10/09 Time 22.50hrs
Fetal Heart Rate Prior to Examination: 143bpm
External Genitalia: NAD
Vagina: NAD
Cervix: No box ticked

Effacement: Fully (circled)
Consistency: No box ticked
Application: Close
Dilatation 10 cms
Presentation: Cephalic (circled)
Relationship to ischial spines -3 (circled)
Position: Vx V High
Membrane: Ruptured (circled)
Liquor: Blood Stained (circled)
Fetal Heart Rate Post Examination: 147bpm

23.00 FH 150 coping well with pain. Reports pressure no urge to push, using Entonox

23.15 Reviewed Obs/Gynae Reg A will PV

23.20 PV Obs/Gynae Reg A
Plan re exam 30mins

23:20 CTG variably good, having variable deceleration
P/A Vt 3/5
V/E Cx Rim of Cx anterior
Caput ++
Station -3
Plan Re examine 30mins

23.30 S/B Obs/Gynae Reg A reduce Synto ↓ 120mls FH 135
CTG Interpretation Form
Date: 27/10/09 Time: 23.30hrs
Baseline fetal heart rate: 140-150bpm
Baseline variability: 10 bpm
Accelerations x 2 in 20mins: Yes ticked
Decelerations: No box ticked
Type of deceleration (if present): Variable box ticked ↓ 90
Uterine contractions:
Frequency: 4 in 10 minutes approx
Duration: 30 seconds approx

23.40 Synto ↓ 90mls^{o}

23.45 FH 160 variability ↓100 quick recovery

Chronology relating to Caesarean Section

23.45 Obs/Gynae Reg A notes that Shauna is still having variable deceleration
o/e Cx ant lip
Caput ++
Station -3
Syntocinon stopped
For LCSC (?Emergency[3])
Non reassuring CTG Δ failure to progress in 1st stage
D/W Consultant Obs/Gynae A

- Theatre and Anaesthetist informed
- Zantac 50g i/v given
- Consent risks – PPH
  - Thrombosis
  - Infection
  - Plan discussed

23.49 Anaesthetist arrives having been contacted by Gynae team. Assessed Shauna. Epidural in situ but not very effective. Spinal anaesthetic explained to Shauna. No foetal distress noted.

23.50 Informed for C/S. Stop Syntocinon. FH 150bpm ↓90. Prep for OT

28/10/09 00.05 Sodium citrate 30mls PO given, transfer to theatre

00.15 Shauna brought to theatre and spinal performed successfully on first attempt. FH checked prior to spinal and was recorded as being normal at 140bpm

00.20 FH 135-140
Paediatric SHO called to attend theatre.

00.24 Spinal completed

Reason for C/S identified as
"Failure to progress in 1st stage and non reassuring CTG"

[3] The presence of a question mark before the word Emergency was unclear on the copy of the notes received by the Review Team and the hospital were asked to check the original notes. They have reported that having checked the original chart it is not clear if the mark is a "?" or an extension of the bracket.

00.29 Shauna ready for incision. Prior to start foetal heart rate was checked 140bpm

00.36 Flat baby born and handed over to Paeds SHO. Asked to call Paeds Registrar and inform Consultant Anaesthetist A, informed of same

Placenta kept to go for histology

00.36 Em C/S for FTA non reassuring CTG noted in chart

Chronology relating to resuscitation of Joshua

00.36 Paeds SHO retrospective account documented 02.30 am- Flat male infant. Apgar 1_5 0_5 , hypotonic, white, no reflex irritability, no respiratory effort. Paeds Registrar called before cord clamped as per Paeds SHO. Meconium present, baby brought to resuscitare. Intubation attempted as meconium present and baby flat. Cords visualised, intubation failed, so gave PEEP @ 20 seconds. HR 60bpm so CPR commenced at 1 minute (1 for HR). SCBU nurse arrived and took over chest compressions from midwife. CPR and PEEP continued until Paeds Registrar arrived at 3mins and then led the resuscitation.

00.39 Paeds Registrar retrospective account documented 03.00 am - Paeds Registrar arrived, baby on resuscitation table receiving oxygen via a mask and neo-puff and chest compressions by SHO on call and SCBU nurse. 100% oxygen via neo-puff, pressure of 20/4cm H_2O and continous chest compressions. Apgar still 0 at 5 minutes. Endotrachael intubation attempted but there was no air entry in the chest, tube was removed and neo-puff resumed with chest compressions. Paediatric consultant on-call called.

00.40 approx SCBU Nurse retrospective notes – called from theatre to come immediately following delivery of a flat baby (Emergency LCSC for FTA).

00.41 approx SCBU Nurse retrospective notes – infant on resusitare, receiving IPPB via neopuff by SHO and getting chest compressions by midwife. Colour pale, white, floppy, no spontaneous respirations, at apex approx 60bpm. Took over cardiac compressions and asked for another SCBU nurse to attend. Confirmed Paediatric Consultant and registrar had been called.

00.43 Paeds Registrar retrospective account documented 03.00 am Endotrachael tube successfully sited with size 3.0 tube, fixed @ 11cm at the lip. Air entry was heard on both sides of the chest. No meconium was seen at the vocal cords upon intubation. 100% O_2 continued via ET tube at a pressure of 20/4cm H_2O. Nasogastric tube inserted. Colour remained pale, white, floppy with no movement or respiratory effort.

00.46 Paeds Registrar retrospective account documented 03.00 am Apgar still 0 at 10 minutes. Chest compressions and 100% O_2 via ET were continuously given till the arrival of the consultant on call.

00.46 Paeds Consultant on Call retrospective account documented 03.00 am -

Called by Paeds SHO, left immediately to attend.

00.51	Consultant Obs/Gynae A Called @ 00.51 from OT to say baby not doing well
00.55	Paeds Consultant on Call retrospective account documented 03.00 am – Arrived in OT. Initial assessment carried out – male child, passed meconium, hypotonic, CR>4 secs, white in colour, no response to stimulation, HR >60bpm, receiving cardiac compressions since first minutes of life, intubated, receiving IPPV via neo-puff, no access available, monitors attached, HR >100 with compressions, sats reading >80%.
00.59 – 01.00	Paeds Consultant on Call retrospective account documented 03.00 am – Adrenaline given via ETT, child de-saturated initially then responded, HR >100bpm for 2-3 mins and then decreased, cardiac compressions resumed, UVC attempted x 2, unable to pass, vessels constricted.
01.00	Consultant B Obs/Gynae arrived in theatre
01.04	Paeds Consultant on Call retrospective account documented 03.00 am – Second dose adrenaline given via ETT, HR responded >100 bpm
01.12	SCBU Nurse A retrospective account documented 28/10/09 Second dose adrenaline given via ETT (this was also documented in Drug Prescription and Administration Record (DPAR) by SCBU Nurse B). Heart Rate stabilised and a decision was taken to transfer to SCBU.
01.14 – 01.34	Paeds Consultant on Call retrospective account documented 03.00 am – Child transferred to SCBU, parents briefed on critical condition of child. In SCBU - monitors attached. HR 80bpm, Sats 60%, child on resusitare, still no other response, capillary refill prolonged >4secs, poor perfusion, minimal central, none peripheral. Intraosseous needle inserted left tibia. Bolus IO NaCl 20ml/ug given over ~ 8 mins. HR <60/min. Followed by IO adrenaline 0.1ml/ug (01.24hrs per DPAR and SCBU Nurse A account). Transient response to heart rate. Cardiac compressions continued. After 1 minute adrenaline 10 repeated (01.24hrs per DPAR and SCBU Nurse A account). No documented cardiac response.
01.35	Paeds Consultant on Call retrospective account documented 03.00 am – Pupils fixed and dilated. No gag response, hypotonic and flaccid. With full agreement of team present all attempts at resuscitation were

discontinued.

01.36 Paeds Consultant on Call retrospective account documented 03.00 am – RIP Joshua in SCBU. Parents informed by Consultant Paediatrician on Call and Consultant Obs/Gynae A. Blessing given by Chaplin on call. Photos taken and child brought down to parents after clinical examination. Parents have consented to full post mortem – coroner to be contacted in the morning by Consultant Obs/Gynae A. Placenta → Histology.
Clinical examination – male infant, BW 4.145kg, OFC 38cm, Ant and post fontanelle √, length 59.9cm, no dysmorphism, all limbs and digits present, no teeth, normal, umbilicus (2 arteries, 1 vein), normal planter/palmer creases, normal anus, normal spine, no birthmarks, caput indent on back of head. May he rest with the angels.

01.50 Baby died a short while ago
Parents and their mothers informed

Chronology relating to Shauna's Post Natal period in hospital

03.45 Returned to Medical for Private Room. Partner staying, For TEDs. For Innohep 4,500 su
IV Fluids 125mls Augumentin 1.2 TDS x 3 days. Analgesia did not have Voltarol in OT
Early neonatal death 01.36 RIP Joshua
Blessing – Fr Peter
(Given to family Photos)
Footprint in Chart
Transfer to cool room after family bonding and viewing as requested. For PM in a/m.
Placenta stored in fridge in Maternity

03.45 Received care of pt following c-section. Pt assisted to bed and sanitary towel in situ. Pt changes into own night clothes. IV Hartmanns and IV nsaline with 20units Syntoconin, Notes with mat staff. Pt reassured family in situ Partner staying the night. Obs stable, minimal blood loss.

04.30 Obs/Gynae Reg rang to inst for 40mls Syntocinon
Memories little life in chart. Family taken photos
Bloods Thurs am from Medical

05.30 Re-site cannula. 40mls Syntocinon in 1litre saline. Unable to put on TEDS, not right fit. For 4,500 innohep, Lochia average Wound dry. Voltarol suppository PR 100mgs

06.00 Gave Difiene PR 100mg as charted. IV N/Saline ↑ Syntocinon and cannula re-sited. Seen by Obs/Gynae SHO. Pt unable to get on TEDs too uncomfortable. Pt for Innohep and IV Augmentin @ 9.30am. Pt 'Baby Bag' left in Maternity, family to collect. U/C draining large amounts.

06.30 Pt doesn't want to be disturbed @ moment, very tired.

11.30 S/B Obs/Gynae Consultant A. IV Augmentin given @ 10.30am. IV fluids Hartmann's 1 litre over 8 hours in progress. Sitting up. Had tea and toast.

Time S/B Psychiatric Consultation Liaison Nurse

	not specified ? am	Referred by Consultant Obs/Gynae A. Shauna was admitted to a medical ward to facilitate her with a single room. Plan – support visit, liaise with CMHT for support post discharge. Visit in afternoon/during admission. Catheter in situ until patient has walked out to toilet. Feeling sore at present. IV Paracetamol 1g 100mls given. S/B Consultant Paediatrician this am. c/o feeling sore not anxious to move. Transferred to maternity unit.
	12.00	Received care of Shauna from medical. Day 1 post LSCS with early neonatal death. BP 150/92 P=85. Apyrexial 36'. On abx Aug 1.2 8hrly given at 12. Due at 20.00. Tylex PRN, Innohep 3,500. Uterus not palpated lochia moderate, urinary catheter removed npu yet. Assistance given to wash. Discussed with Shauna if she wants to see the baby, informed me she would like to see the baby prior to PM. Baby in morgue.
	13.55	Baby brought to the ward to Shauna in room 24. Family all present at Shauna's request. Some time spent alone with partner also. Clothes picked for baby to be put on baby post PM. Chart with x-ray accompanied the baby Joshua to the mortuary. Shauna has made no plans yet for the burial.
	19.40	Shauna upset ++ reassurance given. Tylex for pain
	20.00	Partner wants to stay with Shauna overnight. Shauna does not wish to be left alone and hopes to go home tomorrow if possible.
	22.20	T=36.5 P= 90 BP 136/84 Wound √ unable to give Augmentin as IV cannula tissued. Infant brought to parents room for visit. Grandad and partner also present. Infant then brought to Cold room.
29/10/09	05.08	Day 2 C/S FTA NND Innohep 4,500s/c. Difene 100mg PR given, Tylex II PO. Augumentin 1.2 IV for 3 days.
	09.00	S/B Dr nil ordered. T 36.4 P 80. To remove wound dressing. Condolences offered to both parents, declined analgesia.
	12.00	Visited by Psychiatric Consultation Liaison Nurse. Shauna is already in the system. She has concerns re Shauna. Mental Health d/c plan completed. She will be away tomorrow. No need to arrange anything

Date	Time	Entry
		prior to discharge.
	13.50	Spoke to Shauna and Joey re birth and death of baby Joshua and events surrounding same and burial plans. They hope to arrange burial for next Monday. Have spoken to undertaker in Tullamore and will let us know time. Also will bring own coffin for burial.
	15.00	Baby brought over to Shauna and Joey.
	17.30	Tylex II. Going for shower. B/P 130/90 P80 T36.5 Lochia ave PU√ NBO
	23.00	T 36.9 P=97 BP 107/94 wound √ Shauna requests copy of her file on d/c am. Advised of the procedure for requesting same.
30/10/09	Time not specified	Difene 100mg PO. Wound √ Shower √ Day 3 c/s FID NR CTG Vitals stable. Augmentin 1.2 grms IV 6am - for D/c home - Advice given - Dostinex given PO for engorgement - Good support in the community from the Mental Health Team - PHN informed to remove clips Monday and do support visit - Funeral Sunday. Undertaker to collect Joshua. RIP Sunday - See patient √ - OPD √ - PHN √

Details documented in relation to meetings held with Shauna and her partner following discharge	
21/12/09	Consultant Paediatrician A notes that a draft copy of post mortem received last week. Presented at peri-natal mortality meeting. Discussed with Consultant Obs/Gynae B. I will write to parents and offer formal meeting to discuss PM findings in early January (joint meeting with Consultant Obs/Gynae B)
04/01/10	Letter from Consultant Paediatrician A to Shauna offering a meeting with her and Consultant Obstetrician B to discuss PM report.
04/01/10	Email from admin to Consultant Paed A and Consultant Obs/Gynae B confirming that Shauna had called to arrange a meeting with them. The email sought to confirm a day that would be suitable to arrange the meeting.
05/01/10	Consultant Paediatrician A met with Joshua's parents and the maternal grandfather to discuss the circumstances around Joshua's birth. Consultant Obs/Gynae B also present. Discussed paediatric management after Joshua was delivered and the results/finding of the post mortem. Summary - macrosomic baby - normal appearance - large organs (greater than expected weight) - evidence of acute and chronic haemorrhage, suggestive of intrauterine and interpartum anoxia Discussed possible outcomes - what might have happened if Joshua was delivered half an hour later? Earlier? - Did implanon or MMR given before pregnancy was diagnosed make any difference? Unlikely, no clinical features suggesting this - Why was syntoconin stopped? – due to decels on trace - Why was baby not delivered at that stage? – decels settled – not fully dilated - Did Shauna have glucose tolerance test in view of ↑ BMI? → No, should consider this for future pregnancies - Shauna also concerned that the epidural was not fully effective - Did sustain two falls from a horse in early pregnancy – before diagnosis - Light PV bleed @ 5/12 – scan normal FH √ (9th August)

Shauna stated that she was nervous about returning because she was worried that we would feel it was her fault or our fault. Reiterated that there was nothing that Shauna could have done that would have made a difference.
Family also upset at details after Joshua's death

- too small a coffin – felt he was squashed into it
- left in clothes from SCBU – would have liked to wash and change him but was told she couldn't
- told she could not take him out of coffin, take pictures of him out of coffin
- told she would have handprints, footprints and lock of hair with the booklet → only got footprint with booklet not filled in at all.
- Told she had limited time with Joshua in the room
- Parents rightfully upset because of this

Plan: Consultant Obs/Gynae A to arrange a meeting with the CNM3 in maternity to address these issues. Next couple of weeks

- copy of post mortem to be sent to family once formally sanctioned – still draft.
- Need to find out what she needs to do to obtain a birth cert and death cert.

19/01/10

Consultant Paediatrician A, Consultant Obs/Gynae A and CNM3 Maternity met with Joe and Shauna,.
Discussed last meeting – parents generally happy with discussion. No new questions, conversation focused on the management of Joshua in the days after his death.

- did not see Joshua until they returned to post natal ward
- main people who restricted their interaction were the mortician and an unidentified nurse.

Apologies offered by all team members present. Bereavement information and contacts for counselling given by Consultant Paediatrician A (but prepared by a nurse). CNM3 will also phone family to discuss linking them with a midwife specialising in bereavement counselling. Also birth registration

- Medical follow-up with Consultant Obs/Gynae A for Shauna (she has now also joined Unislim).

Letter to GP

18/02/10

CNM3 Maternity contacted Shauna re registration of baby Joshua birth → forms etc. Advised that same can be collected at Health Centre, Tullamore. Also discussed option of bereavement counselling with (midwife who specialises in this) as mentioned at meeting on the 19/01/10, however Shauna states that she does not wish to avail of service presently, feels she will source her own counselling in Tullamore. I advised that the option remains open and she can contact me anytime.

Analysis

Similar to the format of the Chronology section the following analysis is set out under 4 headings i.e.

- The Induction of Labour
- The Caesarean Section
- The Baby's Resuscitation
- The Post Natal Period

The rationale for this is that care management problems were identified at each of these stages which to a lesser or greater extent contributed to care.

The Induction of Labour

Shauna required induction of labour as her membranes were ruptured and labour was not established. The monitoring of fetal wellbeing whilst on oxytocin was sub-optimal leading to a failure to identify significant foetal distress..

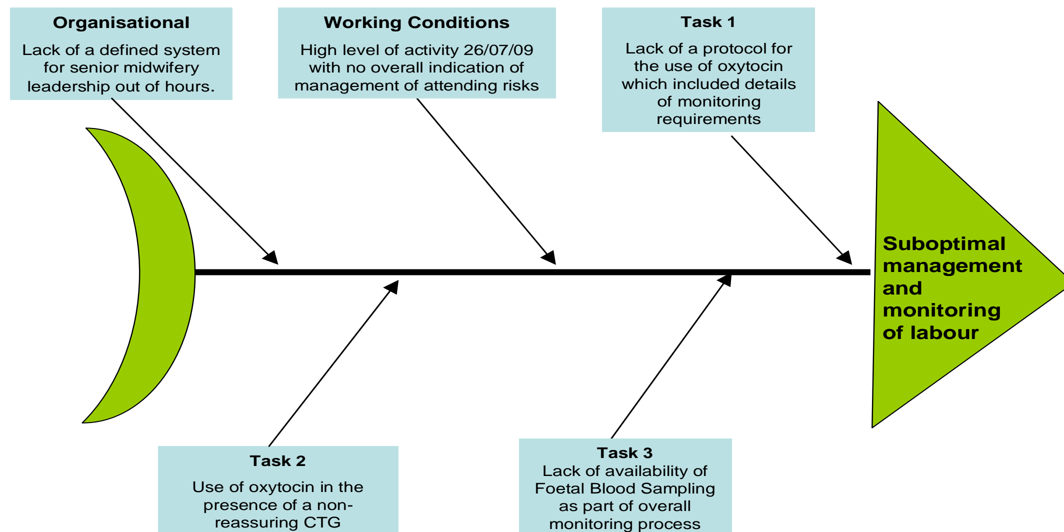

Figure 1: Factors Contributing to the Suboptimal management and monitoring of labour

Intravenous oxytocin may be used to either induce or augment labour. Its use is not without risks and is considered an intra-partum risk factor[4]. Consequently there is a need for close fetal monitoring when this drug is used to induce or augment labour. As with other risk factors the risks and benefits of its use should be discussed with the mother. If

the fetal heart rate is normal, an oxytocin infusion may be increased until the woman is experiencing four to five contractions every 10 minutes.

The oxytocin infusion rate should be reduced by 10 dpm per minute (10 IU in 1L normal saline) initially if contractions occur more frequently than five contractions in 10 minutes. If the fetal heart rate trace is classified as suspicious when an oxytocin infusion is in progress, a review by an experienced obstetrician should be requested. Once reviewed, the obstetrician may recommend that the oxytocin continues to be increased but only to a dose which achieves four to five contractions in 10 minutes.

If the fetal heart rate trace is classified as pathological, the oxytocin infusion should be stopped and clinical reassessment undertaken before the oxytocin is recommenced. [4]

In the report by Prof. McAuliffe into Shauna's care she identified that *"Following rupture of membranes at 40+2 weeks gestation labour was induced with oxytocin which would be standard practice and Ms Keyes received IV benzylpencillin during labour to prevent ascending infection with group B streptococcus".*

She went on to identify that *"The management of the labour was appropriate until 21.30. The oxytocin dose was appropriate and it was stopped initially 17.17 when the CTG was noted to have decelerations. It was then re-commenced when the CTG normalised. "*

Prof. McAuliffe outlined that *"from 21.30 onwards decelerations were noted on the CTG. However there was a failure to appreciate that the CTG was abnormal from 21.30 onwards and no appropriate action was taken; in terms of stopping the oxytocin or performing a fetal blood scalp sampling (FBS) or considering delivery by CS.*

When a CTG is abnormal in labour fetal blood sampling can be an appropriate method of obtaining information on oxygen level of the baby in terms of scalp pH. If this value is less than 7.20 then delivery should occur within 30 minutes. If the pH is greater than

[4] Institute of Obstetricians and Gynecologists Royal College of Physicians of Ireland and Directorate of Strategy and Clinical Programmes Health Service Executive. Clinical Practice Guideline Intra Partum Fetal Heart Rate Monitoring. Guideline No. 6 Version 1.2 June 2012

7.25 then this is normal and labour can continue, though the scalp sampling should be repeated if the CTG remains abnormal with decelerations."

Both the midwife who was caring for Ms Keyes and registrar who reviewed her at 23.20 failed to appreciate that the CTG required immediate attention in terms of fetal blood sampling or delivery by CS. A plan was made to repeat the vaginal examination after 30 mins. The baby was by this time compromised.

At that time in Portlaoise, the use of oxytocin in the Maternity Unit was governed by a shared clinical guideline – Oxytocin Infusion Regime for First and Second Stages of Labour (July 2007), see Appendix 4. Whilst guideline set out the dose and the infusion rates to be applied it did not refer to CTG or Fetal Blood Scalp monitoring or the use of oxytocin in the presence of a non-reassuring CTG. Fetal Blood Scalp sampling was not available at the time.

In relation to staffing on nights in Portlaoise 5 senior midwives were rostered for duty. In many maternity units staffing levels are generally set by reference to a reasonable estimate or professional judgement to the likely activity for any particular period e.g. the number of mothers booked and their respective EDD's. There is also a need to respond to fluctuations in activity in response to the day to day dynamics, which in many instances is achieved though the balancing and timing of elective admissions to the service e.g. deferring elective admissions in times of high activity. The ongoing monitoring of activity over time is also required so as to ensure that any sustained activity patterns become the subject of a workforce planning response.

Shauna was admitted at 06:30hrs on the 27/10/09. At this time the midwifery night staff were on duty i.e. 5 senior midwives and one Health Care Assistant (HCA). This staffing was for both the labour ward and the maternity ward (ante and post natal). She was admitted to the antenatal ward to await events. The midwifery day staff came on duty at 08.00hrs i.e. a CMMII, 5 senior midwives and one HCA. The shift changed again to night duty staffing at 20.30hrs.

According to the birth register there were 11 deliveries throughout the day on the 27/10/09. This is above the average number of deliveries per day which at the time was

6.2 per day. The first baby was born at 01.04 with a total of 11 babies born throughout the day, the last baby being born at 23.00hrs. Of the 11 babies born 6 were standard vaginal deliveries, one was a vacuum delivery and 4 were elective caesarian sections. The time and modes of delivery are set out on the table below.

Date	Time of Delivery	Mode of Delivery	Midwifery Shift
27/10/09	01.04hrs	Standard Vaginal Delivery	Night
	06.04hrs	Vacuum delivery	Night
	08.09hrs	Standard Vaginal Delivery	Day
	09.00hrs	Elective Caesarian Section	Day
	10.06hrs	Elective Caesarian Section	Day
	11.36hrs	Elective Caesarian Section	Day
	12.41hrs	Standard Vaginal Delivery	Day
	17.38hrs	Elective Caesarian Section	Day
	18.54hrs	Standard Vaginal Delivery	Day
	19.55hrs	Standard Vaginal Delivery	Day
	23.00hrs	Standard Vaginal Delivery	Night
28/10/09	00.36hrs	Emergency Caesarian Section	Night
	13.35 hrs.	Standard Vaginal Delivery	Day
	15.24 hrs	Standard Vaginal Delivery	Day
	15.57 hrs	Forceps Delivery	Day
	17.24 hrs	Elective Caesarian Section	Day
	23.43.hrs	Standard Vaginal Delivery	Night

The above information was obtained from the Birth Register as the service was unable to locate the Activity Book at the time of the review. It was not possible therefore to obtain the breakdown of patients by antenatal and postnatal patients but from information available at the change of shift on the night of the 27/10/09 there were 28 patients and on the morning of the 29/10/09 there were 29 patients listed as being on the unit including 4 ‘day 0’ caesarian sections and the nursery.

In relation to staffing NICE recommend that in situations where oxytocin is used that continuous CTG should be used in addition to one to one midwifery care. Given the combined nature of the unit, midwifery staff on night duty would have been busy and therefore not in a position to provide one to one care for mothers in labour and in particular Shauna who was receiving oxytocin.

This level of activity combined with the lack of a nominated shift leader meant that there was no overall person in charge to co-ordinate the work and if required to request access to additional staff. Evidence exists to show that there are established and

evidenced links between patient outcomes and whether organisations have the right people, with the right skills, in the right place at the right time

The risks to patients arising from leadership issues at the front line have been emphasized in a number of recent international reports in relation to patient safety [5,6,7,8].

The Royal College of Midwives (RCM) also identifies the importance of front line leadership and has endorsed the availability of a 24-hour access to a Supervisors of Midwives (SoMs) as this “enables midwives to be able to seek support immediately and enables proactive planning, risk mitigation, and enhances the woman’s birth experience as her choices can be discussed and respected.”[9]

The position adopted by the RCM is corroborated by the findings and recommendations of a King's Fund review, that the role of team leaders in the acute and community settings enhances "staff-well being and delivers high-quality patient care" [10]

The RCN recommends that all ward sisters become supervisory to shifts so that ward sisters can: fulfill their ward leadership responsibilities; supervise clinical care; oversee and maintain nursing care standards; teach clinical practice and procedures; role model good professional practice and behaviours; oversee the ward environment; assume high visibility as the nurse leader of the ward in short to lead nursing to deliver safe, quality

[5] *Compassion in Practice*, NHS England, December 2012. Available at http://www.england.nhs.uk/wpcontent/ uploads/2012/12/compassion-in-practice.pdf

[6] *Report of the Mid-Staffordshire NHS Foundation Trust Public Inquiry,* The Mid-Staffordshire NHS Foundation Trust Public Inquiry, February 2013. Available at http://www.midstaffspublicinquiry.com/

[7] *Review into the quality of care provided by 14 hospital trusts in England: overview report,* Prof. Sir Bruce Keogh, NHS England, July 2013. Available at: http://www.nhs.uk/NHSEngland/bruce keoghreview/Documents/outcomes/keogh-review-final-report.pdf

[8] *A promise to learn, a commitment to act: improving the safety of patients in England,* Don Berwick, Department of Health, August 2013. Available at: https://www.gov.uk/government/publications/berwickreview-into-patient-safety

[9] Royal College of Midwives. Re-framing midwifery supervision: a discussion paper (2015) https://www.rcm.org.uk/sites/default/files/Re-framing%20supervision%20-paper%20for%20discussion%20final%2023%203%202015.pdf

[10] *Leadership and engagement for improvement in the NHS. Together we can.* Report from the King's Fund Leadership Review (2012) http://www.kingsfund.org.uk/publications/leadership-engagement-for-improvement-nhs

care to patients at all times, day or night. This is supported by a NICE Clinical Guideline[11] where they recommend that services "*provide midwifery staff to cover all the midwifery roles needed for each maternity service, including coordination and oversight of each service.*"

The Review Team therefore concludes that the workload within the maternity unit at the time combined with the levels of available midwifery staffing and the lack of a shift leader was a contributory factor in this case.

The Review Team also considered the issue of the availability of senior clinical[12] support within the labour ward. At the time of Shauna's labour during the day there was no named Consultant Obstetrician assigned to cover the labour ward during working hours. Such an arrangement is important in providing supervision to the monitoring of activity and clinical issues on the ward and in ensuring a robust handover to the Consultant Obstetrician coming on call at the end of the working day. Additionally at the time the event occurred the Obstetric Registrar though technically "on site" out of hours his accommodation was not located within the hospital building. Arrangements in relation to assigned consultants within working hours and the proximal availability of senior decision makers outside of hours are of importance in relation to the quality and safety care provision.

Recommendations:

1. That Hospital and Nursing Management ensure there are robust systems and processes in place to assure themselves that there is sufficient staffing capacity and capability to provide high quality care to mothers and babies within the Maternity Unit. This should take account of predictive modeling of need such as the number of mothers booked and their respective EDD's

2. That a midwife shift leader be rostered on the Maternity Unit outside of normal working hours. This person should be supernumerary to other midwifery staff required and therefore be in a position to monitor the workload and provide the

[11] National Institute for Clinical Excellence. *Safe Midwifery Staffing for Maternity Settings (NG4)* February 2015 http://www.nice.org.uk/guidance/ng4/resources/safe-midwifery-staffing-for-maternity-settings-51040125637

[12] Senior clinical support in this instance refers to doctors of Registrar or Consultant Grade

supervision and leadership required to deliver safe, quality care to mothers and babies.

3. Review of the guideline for the use of oxytocin in the induction and augmentation of labour to include reference to monitoring by CTG, the use of fetal blood sampling and the management of a non-reassuring CTG.

4. Staff training on the interpretation of CTG and regular training should be undertaken by all members of staff involved in the management of fetal care.

5. Immediate access to fetal blood sampling (FBS) if CTG is non reassuring. This would allow an accurate assessment of fetal status.

6. Training on interpretation of fetal blood sampling results. This is important to ensure that appropriate management of the case is carried out following a FBS result.

7. Training on oxytocin administration and management of abnormal fetal monitoring whilst on oxytocin

8. That arrangements relating to labor ward obstetric cover is reviewed to ensure that there is a nominated senior clinical decision maker assigned to the labour ward at all times. During working hours this should be a member the consultant staff and outside of working hours the Obstetric Registrar should be available within the hospital supported by the Consultant Obstetrician on Call.

The Caesarean Section

The NICE Clinical Guideline on Caesarean Section classifies urgency of a Caesarean Section as;

1. immediate threat to the life of the woman or fetus
2. maternal or fetal compromise which is not immediately life-threatening
3. no maternal or fetal compromise but needs early delivery
4. delivery timed to suit woman or staff.

It also identifies that delivery at emergency CS for maternal or fetal compromise should be accomplished as quickly as possible, taking into account that rapid delivery has the potential to do harm.

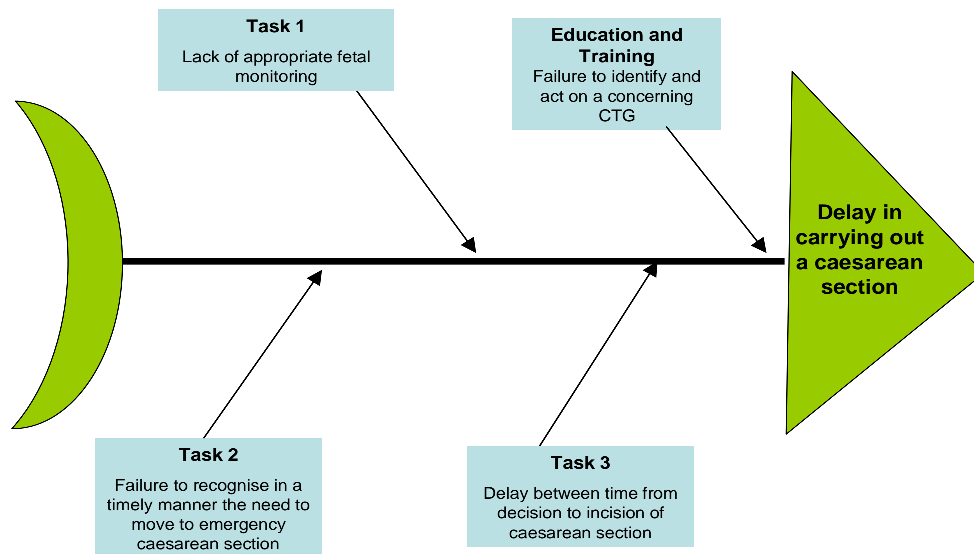

Figure 2. Factors contributing to the delay in carrying out a caesarean section

As outlined in the previous section there was a failure by the midwife to appreciate from 21.30hrs that the CTG was abnormal and required medical review and action that might include consideration of Caesarean Section. At this point, had the abnormal CTG been

noted it would have been appropriate to escalate this clinical concern to the Obstetric Register on Call and request a review of care.

Shauna was subsequently reviewed by the Obstetric Registrar at 23.20hrs and again there was a failure to appreciate that the CTG required immediate action and /or delivery by Caesarean Section. *"This is indicated by the fact that the indication of Caesarean Section was recorded as both a failure to advance and fetal distress"*. Prof. McAuliffe in her report goes on to identify that the *"Failure to appreciate that the CTG was abnormal likely resulted in a 51 minute interval between decision for CS to delivery. During this time the foetus was monitored intermittently with fetal heart auscultation, the baby was not continuously monitored during this time in theatre. Had fetal distress been correctly identified it is likely that the CS would have been performed in a shorter period of time."* The Review Team are of the opinion that had fetal blood sampling been available on the unit at the time it would also have assisted in the assessment of the baby's wellbeing.

The time at which the decision to advance to Caesarean Section was taken was 23.45hrs with Shauna being ready for incision at 00.29hrs, a total time period therefore of 44 minutes.

The time from review by the Obstetric Registrar at 23.45 (who ultimately made the decision to move to Emergency Caesarean Section) to birth at 00.36 was 51 minutes. In 2007 whilst on-call the Obstetric Registrar was accommodated in the administration building across in the car park. Today there is an on call room for the registrar in the delivery suite.

In considering the issue of time from decision to delivery staff from MRHP attending the MDT identified that at the time the process in place for mobilising staff for out of hours emergency sections was an issue and had the potential to add to the time from decision to delivery. The Review Team in considering this issue made reference to the Royal College of Obstetricians and Gynaecologists and the Royal College of Anaesthetists Good Practice No. 11[13].

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[13] Royal College of Obstetricians and Gynaecologists and the Royal College of Anaesthetists Good Practice 11. Classification of Urgency of Caesarean Section – A Continuum of Risk April 2011 https://www.rcog.org.uk/globalassets/documents/guidelines/goodpractice11classificationofurgency.pdf

The Review Team accepts that this guidance was not available at the time of this event and therefore cannot be retrospectively applied however as the focus of this review is one of learning for improvement the Review Team consider that it is relevant in today's service environment. It is therefore the view of the Review Team that it should be adopted by the service in an effort to reduce the time from decision to delivery in cases of emergency caesarean section.

The Review Team also accepts that it is not possible to determine in this case whether at the time the decision was taken to move to caesarean section that a shorter time from decision to incision would have influenced the eventual outcome.

This caesarean section using that guide would be classified as a Class 1 i.e. one in which there is an immediate threat to life of a fetus and requiring immediate delivery. A target Decision to Delivery Interval (DDI) for caesarean section for 'fetal compromise' of 30 minutes is identified as an audit tool that allows testing of the efficiency of the whole delivery team and has become accepted practice; however it also identifies that:

- certain clinical situations will require a much quicker DDI than 30 minutes and units should work towards improving their efficiency
- undue haste to achieve a short DDI can introduce its own risk, both surgical and anaesthetic, with the potential for maternal and neonatal harm.

The Good Practice Guide states that *"Once a decision to deliver has been made, therefore, delivery should be carried out with an urgency* ***appropriate to the risk to the baby and the safety of the mother****. Units should strive to design guidelines that result in the shortest safely achievable DDI. Evidence suggests that any delay is usually associated with the delay in transfer to theatre[14]."*

The Review Team's interpretation of this is that emergency caesarean sections should be carried out in the shortest possible time with regard for the safety of both the mother and the baby and that whilst not saying that this should be within 30 minutes that 30

[14] Tuffnell DJ, Wilkinson K, Beresford N. Interval between decision and delivery by caesarean section: are current standards achievable?Observational case series. *BMJ* 2001;322:1330–3.

minutes should be the time against which deliveries should be audited. This concurred with the discussions held with staff at the MDT meeting.

The Review Team consider that this Guide should form the basis for considering the hospitals response in relation to the management of Emergency Caesarean Section and in particular would feel that the recommendations made within the Guide should form the basis of recommendations relating to Caesarean Section for this report. They are therefore listed below.

Professor McAuliffe in her report also refers to the issue of fetal monitoring at this time. *"During this time the fetus was monitored intermittently with fetal heart auscultation, the baby was not continuously monitored during this time in theatre. Had fetal distress been correctly identified it is likely that the CS would have been performed in a shorter period of time."*

As a consequence the baby was *"born in a very poor condition which was unexpected given the fetal heart was recorded at 135-140bpm prior to the CS".* This finding highlights the importance of continuous fetal monitoring at a time when a concerning CTG is identified. Continuous fetal monitoring should be maintained both during the period of transfer to theatre and whilst preparations are being made to commence the procedure.

Recommendations:

9. Units are encouraged to adopt the Lucas classification of urgency of caesarean section, which uses four categories of urgency without specific time constraints. The concept that there is a continuum of risk is emphasised by addition of the colour spectrum. An individualised approach to assessment of urgency of delivery is required in all cases.

10. Clear channels of communication are vital in cases requiring emergency caesarean section. Units should define the roles of each member of the multidisciplinary team to facilitate communication and effective management. This is particularly important in those cases defined as category 1 (requiring 'immediate' delivery). The categorisation of risk should be reviewed by the clinical team when the mother arrives in the operating theatre.

11. To ‘test’ local channels of communication, units should consider introducing a formal drill for ‘emergency caesarean section’ in their in-house teaching programmes. Such a drill could run from ‘decision made for caesarean section’ to ‘arrival and preparation in theatre’. Again, this is particularly relevant to cases defined as category 1.

12. That continuous fetal monitoring is undertaken in circumstances where a concerning CTG is identified and should be maintained until the baby is delivered.

Recommendations 4, 5, 6 & 7 above also pertain to this section

The Baby’s Resuscitation

The successful transition from intrauterine to extrauterine life is dependent upon significant physiologic changes that occur at birth. In almost all infants (90 percent), these changes are successfully completed at delivery without requiring any special assistance. However, about 10 percent of infants will need some intervention, and 1 percent will require extensive resuscitative measures at birth [15].

During active labour, fetal distress is indicated by an abnormal fetal heart rate so it is important to assess the fetal heart rate regularly. The normal fetal heart rate is 110-150 beats/minute. The gold standard to detect fetal distress is by taking a fetal scalp blood sample to assess fetal hypoxia and acidosis. This was not available at the time of Joshua’s birth in Portlaoise.

Kattwinkel JM, Perlman JM et al identify that anticipation, adequate preparation, accurate evaluation, and prompt initiation of support are critical for successful neonatal

[15] Kattwinkel JM, Perlman JM, Aziz K, et al. Special Report - Neonatal Resuscitation: 2010 American Association Guidelines for Cardiopulmonary Resuscitation and emergency Cardiovalsular Care. Paediatrics 2010
http://pediatrics.aappublications.org/content/126/5/e1400.full.html

resuscitation. They recommend that at every delivery there should be at least 1 person whose primary responsibility is the newly born. This person must be capable of initiating resuscitation, including administration of positive pressure ventilation and chest compressions.

Either that person or someone else who is promptly available should have the skills required to perform a complete resuscitation, including endo-tracheal intubation and administration of medications.[16] With careful consideration of risk factors, the majority of newborns who will need resuscitation can be identified before birth. If the possible need for resuscitation is anticipated, additional skilled personnel should be recruited and the necessary equipment prepared.

Prof. McAuliffe identifies in her report however that *"The baby was then delivered in very poor condition which was unexpected given that the fetal heart was recorded as 135-140 BPM prior to the CS. Given the CTG recordings available and the fact that the fetal heart was recorded within the normal range prior to delivery (110-160BPM) the baby's condition was much poorer than one might have expected. While it is accepted that the CTG was abnormal from 21.30 one would not have expected a baby in such poor condition. Antenatal fetal compromise can result in the delivery of a baby in much poorer condition than expected, however from the medical notes supplied, no evidence of antecedent compromise is found from placental examination nor from maternal blood testing following delivery (no evidence of maternal diabetes, maternal infection nor fetal infection). Oxytocin was stopped once the decision to deliver was made. Therefore one can assume that the fetal condition deteriorated further during the 50 mins between decision to delivery and the CS."*

In assessing the condition of a baby at birth the APGAR Score is used. This is an internationally recognised as the score conducted at one and 5 minutes of age on all newborns. It measures 5 characteristics, Heart rate, respirations, tone, colour and reflexes.

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[16] Am Academy of Pediatrics, Am College of Obstetricians and Gynecologists. In: Lockwood C, Lemons J, eds. *Guidelines for Perinatal Care.* 6th ed. Elk Grove Village, IL: Am Academy of Pediatrics;2007:205

In Consultant Paediatrician, Dr Murphy's report he noted the baby's APGAR score at birth and the resuscitation was as follows:

Parameter	1Min	5Mins
Heart Rate	1	0
Respiratory Rate	0	0
Muscle Tone	0	0
Reflex Irritability	0	0
Colour	0	0
Total	**1**	**0**

He concurred with Prof. McAuliffe in relation to the condition of Joshua at birth i.e. that his condition was very poor with the only sign of life being a slow heart rate (60bpm) which is half the expectant normal heart rate.

At one minute he noted that there was a slow heart rate approximately 60/min. There was no respiratory effort, no muscle tone, no reflex irritability and poor colour i.e. pallor. The total APGAR score was 1. The SHO commenced resuscitation.

The Neonatal Resuscitation Programme in Ireland is based on the Neonatal Resuscitation: American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. This guideline sets out in a sequential order the steps to be taken in relation to newborn resuscitation. See Appendix 5 for a copy of the algorithm supporting this guideline.

At 5 mins Dr. Murphy noted that the baby had no heart rate, no respiratory rate, no muscle tone, no reflex irritability and poor colour i.e. a total APGAR score was 0.

Dr. Murphy in his case review report considered the resuscitation carried out on Joshua in Portlaoise in the context of the Neonatal Resuscitation Programme. He also

considered the accounts of the various clinicians involved in this resuscitation and the report of the coroner.

He also concludes that it had not been expected that the condition of the baby would have been so poor and as far as the Paediatric SHO was concerned she felt she was being called to attend the caesarean section because of a failure to advance rather than a neonatal emergency. The Paediatric SHO immediately commenced resuscitation whilst awaiting the attendance of the Paediatric Registrar who arrived at 3 minutes of age. He intubated the baby at age 7 minutes and the Paediatric Consultant arrived at 9 minutes of age and took over the resuscitation. The Consultant Paediatrician concentrated on the administration of adrenaline via the ET tube and subsequently intraosseous adrenaline and saline.

Dr Murphy concluded that given the very poor condition of the baby at birth that there was no chance that he would respond to resuscitation. Dr Murphy did not conclude that there were deficits in the resuscitation process applied.

Though it would not have changed the ultimate outcome Dr. Murphy did however note that a cord blood gas was not taken at the time of birth and that had this been available it would have helped in the assessment of the baby's condition and therefore guided the management and in particular the likelihood of successful resuscitation.

Recommendation

13. That umbilical cord arterial pH is routinely carried out for all neonates for whom active resuscitation is required.

14. Regular audit (at least monthly) and multidisciplinary discussion of neonates born with acidotic pH and hypoxic ischemic encephalopathy. This would allow staff to discuss and learn from these cases.

The Hospital's response to Shauna and her family in the immediate period following Joshua's death

The death of an infant is a profound loss, and it is important and advantageous to acknowledge families' appropriate need to grieve for their babies. The death of a baby is especially difficult to endure because parents envision an entire lifetime for their baby from the moment of the confirmation of the pregnancy, and because their expectations and vision have been built over time. With the death of their baby, parents lose an entire future. Parents also grieve for the loss of their own parenthood.[17]

Kowalski[18] states that peri-natal death represents multiple losses to parents, including the loss of a significant person, the loss of some aspect of the self, the loss of external objects, the loss of a stage of life, the loss of a dream and the loss of creation. Culturally, a couple whose first pregnancy ends in a loss has not completed the rite of passage into parenthood, which symbolizes adult status[19].

The loss of a child is a high risk variable for the development of complicated grieving. It has been documented that, compared with other types of bereavement, parental grieving is particularly intense, complicated and long lasting, with major and unparalleled symptom fluctuations over time.[20] The process of recovering from the loss of a baby takes time. A period of two to four years seems to be about average for parents, but five or more years of grief is not uncommon.

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[17] Ryan R. Loss in the neonatal period: Recommendations for the pediatric health care team. In: Woods JR, Esposito Woods JL, eds. Loss During Pregnancy or in the Newborn Period: Principles of Care with Clinical Cases and Analyses. Pitman: Jannetti Publications Inc, 1997:125-57.

[18] Kowalski K. Perinatal loss and bereavement. In: Sonstegard L, Kowalski K, Jennings B, eds. Crisis and Illness in Childbearing (Women's Health), vol 3. New York: Grune and Stratton, 1987.

[19] Layne LL. Motherhood lost: Cultural dimensions of miscarriage and stillbirth in America. Women Health 1990;16:69-98.

[20] Rando TA. Parental Loss of a Child. Champaign: Research Press, 1986.

There is therefore no doubt that the actions of the staff within the Maternity Department/Service can either support or undermine parents cope with the grieving process. Leon (1992) identified the importance of the role of staff and noted that bereaved parents never forget the understanding, respect, and genuine warmth they received from caregivers, which can become as lasting and important as any other memories of their lost pregnancy or their baby's brief life.[21]

Many actions in the labour ward, theatre or SCBU that are taken to facilitate the attachment of the parents with their infant will become memories after a neonatal death. Whenever possible, the news of impending death should be discussed rather than waiting until death occurs. Parents appreciate and deserve an honest discussion about why their baby died, including a humane overview of the problems, the actions taken and time to allow them to ask questions. By giving complete and understandable information, there is a smaller chance that parents will feel that health care professionals are hiding something from them. Parents need to spend time with their dying or dead baby. The opportunity to spend time with the baby should be offered on several occasions because some parents may need encouragement. One can ask the parents whether they want to be alone, or to have family or a midwife stay with them; some young parents may be frightened because they have no previous experience with death. Privacy, including privacy for the mother, father and baby as a group, is very important at this stage. This may mean asking additional family members and friends to give the trio some time alone. However, it is important that, at some point, relatives or friends be allowed to see the baby, with the parents' approval. Indeed, these individuals can validate the infant's existence and death, thereby acknowledging the parents' loss and their need for grieving.

Midwives often have the delicate and thoughtful task of collecting mementos such as photographs taken before and after death, ink or plaster foot and handprints, hair, clothing, toys, an identification bracelet, or a record of baby's birth weight and height. Parents should be told why these mementos are being collected to avoid misunderstanding on their part. The manner in which the mementos are given should be compassionate, sensitive and respectful.

[21] Leon IG. Perinatal loss: A critique of current hospital practices. Clin Pediatr. 1992;31:366–74

The care given to a family before and following a perinatal loss can set the stage for the family's entire grieving process.[22] It is essential that every team member, particularly midwives and social workers, provide compassionate care that meets or exceeds parents' expectations. The most beneficial commodities that a health care professional can offer to a grieving family are a nonjudgmental, deep sense of caring and personal involvement.

Follow-up with the parents after discharge is essential to help maintain the healthy grieving that they started in the hospital. The health care professional who has been involved most with the parents in the hospital should follow the parents after discharge. Not only does this provide parents a connection with somebody who knew their baby and their circumstances, but it also offers the caregiver feedback regarding the final outcome for these parents, thereby energizing the provider for future families.

There is no doubt from Shauna's perspective that her experience both at the time of Joshua's resuscitation and after his death that she felt unsupported in her grief. Included amongst her issues are;

- That Joshua died without herself or Joseph being present
- That her and Joseph's mothers were told of Joshua's death before her and Joseph and that Joshua was passed to them first rather than she and Joseph.
- That there were a limited number of photos taken and that the memonto's saved were not presented in an acceptable manner
- That it was suggested that she would be transferred back to the labour ward that night. She said she couldn't stay there as she would hear other babies cry and be reminded that her baby never would. (She was ultimately moved to the ground floor for the night).
- She found the discussions regarding the detail of the post mortem distressing.
- There was limited opportunity for Joshua to remain with her

[22] Leoni LC. The nurse's role: Care of patients after pregnancy loss. In: Woods JR, Woods JLE, eds. Loss During Pregnancy or in the Newborn Period. Pitman: Jannetti Publications Inc, 1997;361-86.

- That Joshua was brought to her room he was in a ‘coffin’ which she felt was too small and box like.
- Though provided with a private room on the maternity ward she was distressed by the sound of other babies crying.
- That family members did not get time to spend time with Joshua
- That she was not allowed to hold, change, wash or dress Joshua as she would have liked.
- The nature and level of information provided to Shauna and Joseph in relation to Joshua’s death both in the immediate aftermath and subsequently to that.

From listening to Shauna’s account of her experience the Review Team considered that key to this experience was the failure of the hospital to have in place a consistent, individualized approach to the support of a mother and her family at the time of a neonatal death. The factors that contributed to this failure are identified in the diagram below.

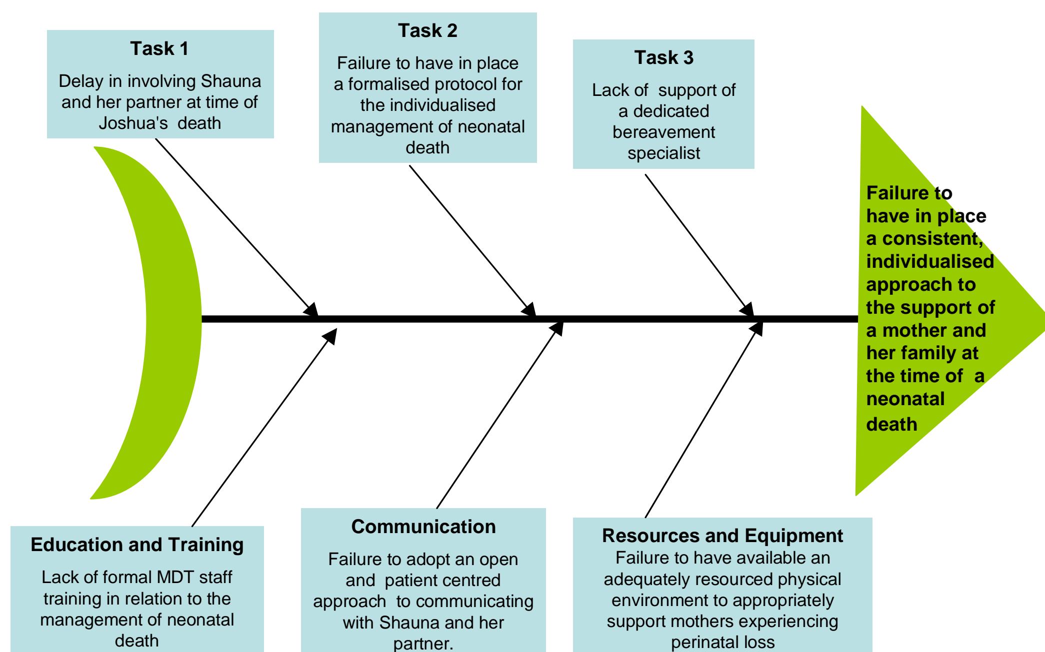

Figure 3. Factors contributing to the Failure to have in place a consistent, individualised approach to the support of a mother and her family at the time of a neonatal death

Though it is accepted that the issue of primary importance in the time following delivery was the attempt to resuscitate Joshua and that the focus of staff were on this Shauna and Joseph nonetheless felt isolated from events. Given that the resuscitation period i.e. from Joshua's birth to his death was approximately one hour, that Shauna had a spinal rather than a general anaesthetic and that the event of a poor outcome was likely it does not appear that consideration was given to facilitating the attendance of the parents in the SCBU at the time of death. The fact also that the news of Joshua's death was communicated to both Shauna and Joseph's mothers in advance of being communicated to them was also regrettable. From the perspective of Shauna the fact that she or Joseph did not get to be with Joshua as he died contributed to their overall sense of loss and if circumstances are such that resuscitation efforts take place some distance from where the mother is being cared for it would appear critical to have a formal communication mechanism in place to keep parents informed on progress and if it is deemed likely that the outcome will be poor that opportunity is provided for them to be with their baby in the final stages of life.

In relation to the period after the death of a newborn, the Review Team considers that having in place a formal guideline for the management of a perinatal death, individualised for each mothers unique set of circumstances, is an essential element of good care. Whilst the HSE's Open Disclosure Policy was not available at the time of this event, the Review Team are of the opinion that the guideline for the management of perinatal death should take account of the requirements of the Open Disclosure Policy to ensure that an open, consistent approach to communicating with families is undertaken from the outset.

In Shauna's case this was of particular importance given Shauna's age (she had recently turned 18), that she was a young mother having her first child and that she had ongoing contact with the mental health services. In other words she was a very vulnerable young woman for whom the significant impact of the neo-natal death of her baby should have had been anticipated and managed in a person centred manner which was particularly sensitive and empathetic.

Guidelines for supporting mothers following a neo-natal death should take account of best practice which is supported by research findings and also emphasise the need for

their contextualisation and individualisation to the particular set of circumstances that pertain to a mother. There should be not only an emphasis on the core tasks required in the aftermath of such a death e.g. the gathering of mementos, the funeral arrangements etc but also on the need for skilled facilitation in relation to the emotional impacts which can often be of a very individual kind. The checking of understanding both in terms of information provided and the emotional response to such information is essential. This can be framed simply in terms of 'what matters to you' rather than assuming staff know 'what matters to mothers' in a more general sense.

At the time of Joshua's death there was not a formalised guideline in place to guide staff in the delivery of a consistent approach to supporting mothers and families in relation to neonatal death.

Whilst the availability of such a guideline would set in place the foundation that is required, the area of bereavement management is specialized and requires continuation beyond the mother's discharge from hospital. There is therefore a need to have available a specialist nurse/midwife designated for this purpose.

Designated bereavement support nurses/midwives can be an invaluable source of help and support both for bereaved parents and for other health professionals. It is the role of the Bereavement Nurse/Midwife to;

- provide direct support to women and their families who have experienced fetal loss or the death of a baby within the maternity setting.
- provide guidance & support to midwifery and medical staff when caring for women experiencing loss in pregnancy, stillbirth or early neonatal death.
- act as an educational resource for staff on physical, psychological and administrative aspects of bereavement care through the provision of training.
- to coordinate a team of link midwives identified to ensure consistency of care leading to a high quality seamless service even if they are not on duty at the time of a bereavement.

At the time Shauna delivered Joshua there was no access to a designated bereavement support nurse/midwife.

A further issue of importance relates to the availability of an environment of care that allows parents the privacy and comfort to start the process of grieving for their loss. Although space in most hospitals is at a premium, the provision of a dedicated room for these parents can make a fundamental difference to their experience. Such a room should be, where possible, separate from the post-natal ward/unit, be capable of facilitating the woman's partner to stay with her if desired and be staffed by midwives to allow for continuity of care. Services should also facilitate the parents with easy and if requested uninterrupted access to their baby. Questions parents may have in relation to the birth or post natal arrangements should be answered openly with ample opportunity provided to clarify any matters.

Recommendations

15. That all Maternity Services should have in place a formalised guideline to ensure the delivery of a consistent approach to the support of mothers and families experiencing stillborn or neonatal death. Such guidelines should be developed with the involvement of families and relevant advocacy and support groups.

16. That Maternity Services recognise that each mother and their partners will have unique needs which must be recognised and addressed within the framework of the guideline to support of mothers and families experiencing stillborn or neonatal death. Respect and understanding for the individual nature of experience is fundamental to care and the approach adopted should be tailored to their individual needs.

17. That the implementation of the guideline to support of mothers and families experiencing stillborn or neonatal death must be accompanied by appropriate staff training for both those involved both direct and in-direct care of the mother and be the subject of on-going audit to ensure consistency of application over time. This guideline should take account of the requirements of the HSE's Open Disclosure Policy.

18. All maternity units should appoint a specially trained bereavement nurse/midwife who is responsible for staff training and support, and for monitoring and audit of the guideline to support of mothers and families experiencing stillborn or neonatal death to ensure that bereaved parents receive high quality care.

Meetings with Shauna and Joseph following her discharge from hospital.

Shauna was discharged from hospital on the 30/10/2009 and referrals were made to her public health nurse and the community mental health team. Arrangements were also made to review her at the post-natal out patients clinic.

A copy of the draft post mortem report was received by the Consultant Paediatrician during the week of the 14/12/09 and this was discussed at the peri-natal mortality meeting. On the 21/12/09 the Consultant Paediatrician notes that she will write to the parents and offer them a formal meeting to discuss the PM findings in early January. This is to be a joint meeting with the Consultant Obstetrician. Shauna receives this letter on the 04/01/10 and immediately emails to arrange the meeting. This meeting is held the following day i.e. 05/01/10 and is attended by Shauna, Joseph and Shauna's father. At this meeting the paediatric management after delivery, the findings of the post mortem and issues and possible outcomes were discussed. It is documented that Shauna should not feel that anything that happened was her fault. Shauna went on to outline details of issues arising following Joshua's death and the impact that these had on her and Joseph. A follow up meeting was arranged for Shauna and Joseph with the CNM3 for Maternity.

The follow up meeting was held on the 19/01/10 and was attended by the Consultant Paediatrician, the Consultant Obstetrician the CNM3, Shauna and Joseph. Conversations focused on the days following Joshua's death and apologies were offered by all team members present. Bereavement information and contacts were provided to Shauna and Joseph and the CNM3 undertook to ring them and discuss linking them with a midwife who specialised in bereavement counselling. The CNM3 followed up, ringing Shauna on the 18/02/10.

Both expert reports obtained for this review concluded from the account detailed in the medical record, that the meetings held after the post mortem report were received indicated that all facts were communicated in a professional manner the paediatric report identifying that they demonstrated both empathy and sympathy. Shauna however in her meetings with the Review Team felt that the meetings whilst they did deal with many of

the facts relating to her care were not personalised and consequently did not address her need for personal support nor did she feel assured in relation to actions to be taken on foot of her experience.

The Review Team are of the opinion that though these meetings were carried out both in a timely and professional manner that the issues of most concern related to events relating to the compassion of care received and as such were not capable of explanation in the same way as more factual clinical matters. In some respects the opportunity for remediation was passed.

On the 23/24th September 2013, nearly 4 years after Joshua's death the Coroners' Inquest was held. This was a significant event for Shauna who had contacted the Coroner approximately 6 months after Joshua's death to inquire about when the inquest was due to be held. Shauna followed up with a number of telephone calls to his office in the intervening period. Shauna has consequently formed the opinion that the inquest was only held as a result of her continued insistence rather than it being a planned event.

The Review Team contacted the Coroner in relation to the perceived delay in the holding of this inquest. He stated that on receipt of the post mortem report he had met with Shauna and Joe and had made a determination-decision to hold an inquest. He referred to a difficultly in assembling the required information from contemporaneous records and that the opening the preliminary inquest on the 1st July 2013 allowed for the generating of all information required to get discussion underway. The full inquest was held on the 23/24th September 2013.

Shauna attended the inquest with Joseph and was understandably apprehensive about the process. The inquest resulted in a narrative verdict and the coroner made two recommendations in his report. These are as follows:

1. It is recommended that in respect of any written guidelines in relation to the use of Syntocinon or any like drug that there should be written guidelines on its use and that these guidelines should be adopted on a national basis and revised from time to time on a national basis.

2. That in respect of the naming and categorisation of any emergency procedures of an obstetric nature that there should be a national guideline on the categorisation of the cases having regard to current medical practice and also international practice and that these guidelines again should be adopted on a national basis.

Apart from the process of the actual inquest itself Shauna spoke from her perspective in relation to how staff from Portlaoise attending the inquest, conducted themselves on the day. As the mother of the child to which the inquest pertained she felt the behaviour of staff lacked respect in that they did little to acknowledge her, she observed some staff texting between each other during the process noted some at times whispering and laughing. This added to the stress and distress she was experiencing in attending.

Shauna is not alone in her experience of the coronial process. In their response the fundamental review of Coroner Services in the UK[23] INQUEST, a non-governmental organisation in Britain that works directly with bereaved families and friends on inquest procedures and their rights in the Coroner's Court identified that;

"Regrettably, our survey indicates that the majority of bereaved families facing inquests lack access to appropriate information and assistance. Furthermore – and a probable related result – most suffer some serious adverse effect to their health and personal lives in the medium to long term".

Similarly in Ireland, Section 3.4.2 of the Review of the Coroner Service (2000)[24] identifies that;

"One of the weaknesses in the existing service lies in the lack of administrative support required to deliver optimal services to relatives. Ongoing support of relatives during the

[23] INQUEST (2002) How the inquest system fails bereaved people – INQUEST's Response to the Fundamental Review of Coroners Services.
http://www.inquest.org.uk/pdf/how_the_inquest_system_fails_bereaved_people.pdf

[24] Department of Justice, Quality and Law Reform. Review of the Coroner Service (2000) – Report of the Working Group http://www.justice.ie/en/JELR/ReviewCoronerService.pdf/Files/ReviewCoronerService.pdf

whole cycle involved in a coroner's investigation is critical and often beyond the capacity of individual coroners as presently organized."

The report recommended the move to a regional structure for coronial services which would include the introduction of a new post of coroner's officer to act as a general support to both coroners and relatives. In 2007 the Department of Justice and Equality published the Coroner's Bill 2007 which incorporates many of the recommendations made by the Working Review Group in 2000. This Bill has yet to be enacted and consequently the post of coroner's officer has not yet been introduced.

According to the Coroner Service, support for relatives is currently provided either directly from hospitals or through voluntary support/advocacy groups. The Coroner Service also have available and information leaflet[25] outlining the key stages in the coronial process and support service contacts are available on their website www.coroners.ie.

In preparation for the inquest Shauna had the support of a solicitor who was present on the day of the inquest. The role of the solicitor was to support Shauna and Joseph from the perspective of the legal process rather than provide them with personal support. They would also have welcomed support from an advocate both after baby Joshua's death and also in preparation for and on the day of the inquest.

In his response to the Review Team the Coroner for Laois acknowledged that experiences such as neonatal death cause particular stresses for families and 'would welcome additional support groups for very particular cases'. He understands that there are support groups for neonatal death and deaths in young children and 'thinks further development in this area is very much to be welcomed.'

It is the opinion of the Review Team that provision of information in relation to support and advocacy groups should be provided prior to discharge so that parents may avail of it should and when they require it.

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[25] http://www.coroners.ie/en/CS/CS%20-%20InformationLeaflet.pdf/Files/CS%20-%20InformationLeaflet.pdf

Recommendations

19. That health service staff attending a Coroner's Inquest be aware of how their demeanor and conduct may be interpreted by relatives and families. Staff should demonstrate empathy and sensitivity towards relatives and families for whom the experience can be stressful and involve them in re-living the circumstances of the death of their loved one.

20. That prior to discharge and as part of the information provided to parents experiencing the death of a neonate that written information and contact details of relevant support groups be provided to them.

Incidental Finding

The main purpose of conducting a review is to find out what happened, why it happened and what needs to change to reduce the risk of a similar event occurring in the future. The focus of attention is therefore on the event itself but not uncommonly during the conduct of the review a team may identify an area where an opportunity for improvement exists that did not in itself contribute to the event i.e. an incidental finding.
One such opportunity was identified and this related to the system for allocation of appointments for the Antenatal Booking Clinic at Midland Hospital Portlaoise.

Shauna attended her GP initially on the 6th March 2009 for the insertion of an Implanon contraceptive device. Shauna did not consider that she might be pregnant and her GP did not conduct a pregnancy test prior to insertion of the device. Upon discovering she was pregnant the Implanon device was removed by her GP and Shauna was referred to the Antenatal Booking Clinic at Midland Hospital Portlaoise. She was 18 weeks pregnant at this time. It is at the Antenatal Booking Clinic that the first ultrasound scan (also known as the dating scan) is carried out.

Evidence shows that the best time for a dating scan is in the first trimester[26]. Dating scans carried out after this time can be less reliable as fetal growth rates can vary. Referral to the Antenatal Booking Clinic at 7 weeks therefore should have allowed time

[26] https://www.nice.org.uk/guidance/cg62/chapter/appendix-d-antenatal-appointments-schedule-and-content

for the conduct of the dating scan with the first trimester. Referral to the Antenatal Booking Clinic at 18 weeks therefore militated against accurate dating of the estimated delivery date (EDD) for Baby Joshua. This was however outside the control of the hospital.

This was however Shauna's first pregnancy, she was 17 years old, a young mother and as such should have been prioritized for an appointment. The Midland Hospital Portlaoise however had at this time a waiting list in place for first visits to the Antenatal Clinic. Shauna was ultimately seen at the booking clinic on the 13/07/09 i.e. 7 weeks after referral by her GP. She was by this time 25 weeks pregnant. The Review Team understand that at the time there was no system in place at the time to prioritise referrals for attendance at the Antenatal Booking Clinic to ensure that women were seen within the first trimester or as in Shauna's case a late booker. It is also of note that Shauna had two attendances at the hospital following referral by her GP and prior to her first Antenatal Visit. The second attendance resulted in her admission, having been brought in by ambulance outside of working hours. There was no evidence identified to suggest that either of these attendances prompted a re-think about rescheduling the Booking visit.

Recommendations

21. That the Department of Obstetrics and Gynaecology at the Midland Hospital Portlaoise develop, implement and monitor a Maternity Booking and Antenatal Care Policy. This policy should set out evidence based information on best practice for baseline clinical care at the point of early contact in pregnancy and comprehensive information on the booking process, to enable clinicians and pregnant women to make decisions about appropriate care. It should also address the issue of location of the booking clinic as this does not necessarily have to be the place of delivery.

22. That waiting lists for Antenatal Booking Clinics be actively monitored to ensure that women referred are, where possible, seen within the first trimester.

23. That pregnant women who attend unscheduled to hospital for treatment associated with or for a condition that could adversely impact on their pregnancy, before their first antenatal clinic visit should be offered a soon/early booking visit.

Summary of Recommendations made in this Report

The table below sets out in summary all recommendations made in this report. The recommendations made **pertained to the circumstances which existed in 2009** when the majority of the events reviewed occurred.

In recognition of the fact that the Maternity Service in the MRHP has in recent years seen the introduction of significant change, the hospital was requested to review the recommendations prior to finalisation of the report and to provide a response to these to reflect areas for which changes have been made as a result of the significant programme of change being undertaken at the hospital.

Finally whilst the recommendations made pertain to the MRHP the recommendations should be shared with all maternity services in Ireland so that they can be considered for application in their individual contexts.

1.	That Hospital and Nursing Management ensure there are robust systems and processes in place to assure themselves that there is sufficient staffing capacity and capability to provide high quality care to mothers and babies within the Maternity Unit. This should take account of predictive modeling of needs such as the number of mothers booked and their respective EDD's
	Hospital Response: Birth Rate Plus study was completed and staffing levels have been agreed for the unit to include a Shift Leaders on all duties. A Bereavement Midwife is in place. A workforce planning document has been completed and implemented. There are a number of additional posts filled in the Maternity Unit.
2.	That a midwife shift leader be rostered on the Maternity Unit outside of normal working hours. This person is supernumerary to other midwifery staff required and therefore be in a position to monitor the workload and provide the supervision and leadership required to deliver safe, quality care to mothers and babies.

	Hospital Response: There is a Shift Leader on duty on all duties 24/7 and is rostered supernumerary to the shift staff. This means that they are therefore in a position to monitor the workload of midwives and provide the supervision and leadership required to deliver safe, quality care to mothers and babies
3.	Review of the guideline for the use of oxytocin in the induction and augmentation of labour to include reference to monitoring by CTG, the use of fetal blood sampling and the management of a non-reassuring CTG.
	Hospital Response: There are a number of new guidelines in place, including, the use of oxytocin in the induction and augmentation of labour, fetal heart rate monitoring in labour, the guideline for the use of fetal blood sampling. Staff training in relation to these guidelines has/is being provided. Close monitoring of these guidelines are in place which includes Audit and Incident reporting
4.	Staff training on the interpretation of CTG and regular training should be undertaken by all members of staff involved in the management of fetal care.
	Hospital Response: Staff training on fetal heart workshops and attendance at Centre of Midwifery Education, Coombe Women and Infants University Hospital, every two years occurs for midwifery staff involved in the management of fetal care is mandatory. K2, which is an international online interactive training programme for Healthcare Professionals in Obstetrics and Maternity Services training is also mandatory. Regular CTG study days are facilitated each year with the Coombe Women and Infants University Hospital
5.	Immediate access to fetal blood sampling (FBS) if CTG is non-reassuring. This would allow a relatively accurate assessment of fetal status.
	Hospital Response: Access to fetal blood sampling is now available at the hospital. There are two blood sampling machines in Delivery Suite in the event that one machine breaks down. Continuous training is provided by the company who supplied the

	machines. To ensure the quality of performance in relation to sampling carried out the quality control of the machines is carried out by the Laboratory Scientist on a scheduled basis.
6.	Training on interpretation of fetal blood sampling (FBS) results. This is important to ensure that appropriate management of the case is carried out following a FBS result.
	Hospital Response: The training on the interpretation of Fetal Blood Sampling is part of the CTG Training and all staff are trained in the use of the Fetal Blood Sampling machine. The interpretation on the acid based balance is included in the K2 training programme
7.	Training on oxytocin administration and management of abnormal fetal monitoring whilst on oxytocin
	Hospital Response: This response for this recommendation has been covered in to the response to recommendation No 3.
8.	That arrangements relating to labor ward obstetric cover is reviewed to ensure that there is a nominated senior clinical decision maker assigned to the labour ward at all times. During working hours this should be a member the consultant staff and outside of working hours the Obstetric Registrar should be available within the hospital supported by the Consultant Obstetrician on Call.
	Hospital Response: Consultant Obstetrician is on-call 24/7.The Obstetric Registrar is available on-site 24/7 and the on-call room is in the Labour Ward.
9.	Units are encouraged to adopt the Lucas classification of urgency of caesarean section, which uses four categories of urgency without specific time constraints. The concept that there is a continuum of risk is emphasised by addition of the colour spectrum. An individualized approach to assessment of urgency of delivery is required in all cases.
	Hospital Response: Lucas classification of urgency of caesarean section has been adopted into use and an individualized approach to assessment of urgency of delivery is in place

	in all cases.
10.	Clear channels of communication are vital in cases requiring emergency caesarean section. Units should define the roles of each member of the multidisciplinary team to facilitate communication and effective management. This is particularly important in those cases defined as category 1 (requiring 'immediate' delivery). The categorization of risk should be reviewed by the clinical team when the mother arrives in the operating theatre.
	Hospital Response: The HSE's ISBAR (Identify -Situation-Background-Assessment-Recommendation) clinical communication tool has been implemented to ensure that there is a structured approach to the clear communication of clinical information in clinical handover situations. This is supported by a Communication policy which is in place at the hospital. Each member of the Multidisciplinary team is aware of their roles and responsibilities. Practical Obstetric Multi-disciplinary Training (PROMPT) and related drills are in place. This is closely monitored and audited on an ongoing basis.
11.	To 'test' local channels of communication, units should consider introducing a formal drill for 'emergency caesarean section' in their in-house teaching programmes. Such a drill could run from 'decision made for caesarean section' to 'arrival and preparation in theatre'. Again, this is particularly relevant to cases defined as category 1.
	Hospital Response: Multiple Regular Emergency drills are in place to improve and reduce the time taken from decision to incision.
12.	That continuous fetal monitoring is undertaken in circumstances where a concerning CTG is identified and should be maintained until the baby is delivered.
	Hospital Response: This is now in place.
13.	That umbilical cord arterial pH is routinely carried out for all neonates for whom active resuscitation is required.
	Hospital Response: Cord PH is currently carried out on all infants requiring resuscitation or those

	babies for whom staff have had concerns during labour.
14.	Regular audit (at least monthly) and multidisciplinary discussion of neonates born with acidotic pH and hypoxic ischemic encephalopathy. This would allow staff to discuss and learn from these cases.
	Hospital Response: All cases are discussed at the Perinatal monthly mortality meetings the attendance at which includes Obstetrical Paediatric and Midwifery staff.
15.	That all Maternity Services should have in place a formalised guideline to ensure the delivery of a consistent approach to the support of mothers and families experiencing neonatal death. Such guidelines should be developed with the involvement of families and relevant advocacy and support groups.
	Hospital Response: There is a Management of Intrauterine Fetal Death Guideline now in place. This Guideline has been developed with feedback from meetings with the Serious Incident Management Team [SIMT]. There is also a Bereavement Committee in place. A number of Bereavement Study Days have been held for staff. These study days were facilitated by the Centre of Nurse Education and by the Irish Hospice Foundation.
16.	That Maternity Services recognise that each mother and their partner will have unique needs which must be recognised and addressed within the framework of the guideline to support of mothers and families experiencing stillborn or neonatal death. Respect and understanding for the individual nature of experience is fundamental to care and the approach adopted should be tailored to their individual needs.
	Hospital Response: There is a Management of Intrauterine Fetal Death Guideline in place which recognizes the need for the individualisation of care to mothers and their partners at the time of a neonatal death. This Guideline acts to inform the Bereavement Midwife in the provision of individualised support for the care of mothers and families at such times. This guideline also provides guidance for all staff in the provision of care for women and families.
17.	That the implementation of the guideline to support of mothers and families experiencing stillborn or neonatal death must be accompanied by appropriate

	staff training for both those involved both direct and in-direct care of the mother and be the subject of on-going audit to ensure consistency of application over time. This guideline should take account of the requirements of the HSE's Open Disclosure Policy.
	Hospital Response: Training has been provided on bereavement for all staff i.e. for those involved both directly and indirectly involved in caring for women and families experiencing neonatal loss. To ensure consistency of care, audits have been, and will continue to be, carried out in relation to this. Open Disclosure is in place and ongoing training continues. Our goal is to have open, consistent, compassionate, honest communication with the patient, client and families including expression of regret.
18.	All maternity units should appoint a specially trained bereavement nurse/midwife who is responsible for staff training and support, and for monitoring and audit of the guideline to support of mothers and families experiencing stillborn or neonatal death to ensure that bereaved parents receive high quality care.
	Hospital Response: A midwife with special interest and training in bereavement is in place.
19.	That health service staff attending a Coroner's Inquest be aware of how their demeanor and conduct may be interpreted by relatives and families. Staff should demonstrate empathy and sensitivity towards relatives and families for whom the experience can be stressful and involve them in re-living the circumstances of the death of their loved one.
	Hospital Response: Legal and management support is available for staff
20.	That prior to discharge and as part of the information provided to parents experiencing the death of a neonate that written information and contact details of relevant support groups be provided to them.
	Hospital Response: Prior to discharge, all women who experience neonatal death are given written information and contact details of the Bereavement Midwife and support group details are provided.

21.	That the Department of Obstetrics and Gynaecology at the Midland Hospital Portlaoise develop, implement and monitor a Maternity Booking and Antenatal Care Policy. This policy should set out evidence based information on best practice for baseline clinical care at the point of early contact in pregnancy and comprehensive information on the booking process, to enable clinicians and pregnant women to make decisions about appropriate care. It should also address the issue of location of the booking clinic as this does not necessarily have to be the place of delivery.
	Hospital Response: The Department of Obstetrics and Gynaecology at the Midland Hospital Portlaoise have developed, implemented and monitor a Maternity Booking and Antenatal Care Pathway. This pathway sets out evidence based information on best practice for baseline clinical care at the point of early contact in pregnancy and comprehensive information on the booking process, which enable clinicians and pregnant women to make decisions about appropriate care. To support this, a Maternity Care Pathway Guideline is in place and a Maternity Care booklet for mothers has been developed.
22.	That waiting lists for Antenatal Booking Clinics be actively monitored to ensure that women referred are, where possible, seen within the first trimester.
	Hospital Response: The waiting lists for Antenatal Booking Clinics are actively monitored. All women are seen by 12 weeks gestation where possible, accepting that some women book late.
23.	That pregnant women who attend unscheduled to hospital for treatment associated with or for a condition that could adversely impact on their pregnancy, before their first antenatal clinic visit should be offered a soon/early booking visit.
	Hospital Response: Pregnant women who attend unscheduled to hospital for treatment associated with or for a condition that could adversely impact on their pregnancy, before their first antenatal clinic visit are now, as routine, offered a soon/early booking visit

Action plans

The recommendations made in this report that relate to MRHP should now be considered by the Hospital Group CEO in conjunction with the Hospital Manager and cross referenced with the hospitals overall improvement plan for maternity services. Any actions required to implement recommendations made in this report, which are not already included in this improvement plan, should be included and responsibility for them assigned to a named individual and a timeframe for implementation agreed. The achievement of the overall improvement plan should be monitored and verified by the Hospital Group CEO so that assurance is gained in relation to implementation of all actions within the agreed timeframes.

Arrangements for shared learning

At a local level i.e. MRHP this report should be considered at the Maternity Services Management Team meeting and shared with staff within the service at a multidisciplinary meeting within the service.

It should also be shared with other relevant services within the Hospital Group by the Hospital Group Clinical Director for Obstetrics and Gynaecology where learning can be considered and applied within those services.

The sharing of learning with other services nationally should be coordinated by the Acute Hospitals Division and carried out in conjunction with the National Clinical Lead for Obstetrics and Gynaecology and the HSE Director of the Office of Nursing and Midwifery Services.

Appendices

Appendix 1. Terms of reference for the investigation ref 50577

Introduction

These are the terms of reference for a systems review commissioned by Mr. David Walsh, Regional Director Performance and Integration Dublin Mid Leinster into an incident related to the care of a mother and the death of her baby on the 28th October 2009 at the Midland Hospital Portlaoise.

Purpose

The purpose of this review is to:

→ Establish the factual circumstances relating to the case

→ Identify any key causal factors that may have occurred

→ Identify the factors that contributed to the key causal factors

→ Recommend actions that will address the contributory factors so that the risk of future harm arising from these factors is eliminated or if this is impossible, is reduced as far as is reasonably practicable.

Scope of the Review

The review will consider the care provided to the woman from her admission to Portlaoise Hospital on the 27th October 2009 until her baby's death on the 28th October 2009. The review will also consider the support provided by the hospital to Shauna and her partner following the baby's death.

Review Team Membership

→ Cornelia Stuart, Regional Quality and Patient Safety Manager HSE Dublin North East, Review Team Chairperson.

→ Ms Sheila Sugrue, HSE National Lead in Midwifery

The team will access support and expert advice from the Institute of Obstetricians and Gynaecologists and the Faculty of Paediatrics as required from;

Prof. Fionnuala McAuliffe, Consultant Obstetrician and Gynaecologist,

Dr. John Murphy, Consultant Paediatrician.

The involvement in this case of Prof. McAuliffe and Dr. John Murphy is limited to providing a report based on the case notes and information provided to them by Ms. Sheila Sugrue and Cornelia Stuart and reviewing and providing comment on the draft report.

Ms Sugrue and Ms. Stuart will meet with the mother and their support person at the outset of the process in order to fully understand their perspective on issues pertaining to the review. The chronology of care developed as part of the process will be provided to them by Ms. Sugrue and Ms. Stuart. Staff meetings will be the remit of Ms. Sugrue and Ms. Stuart.

Prof. McAuliffe and Dr. Murphy will be given the final report incorporating their reports for review of context of environment in which the care was delivered.
The final report and HSE exec report should take account of findings from other ongoing investigations into the same hospital.

Through the Chairperson, the Review Team will:

→ Be afforded the assistance of all relevant staff in Midland Hospital Portlaoise and other relevant personnel.
→ Have access to all relevant files and records (subject to any necessary consent/Data Protection requirements).

Should immediate safety concerns arise, the Chair of the Investigation Team will convey the details of these safety concerns to the Commissioner as soon as possible.

Methodology

The review will follow a systems review methodology outlined in the HSE guidelines and will be cognisant of the rights of all involved to privacy and confidentiality; dignity and respect; due process; and natural and constitutional justice.
The review will commence on the 7th May 2014 and will be expected to last for a period of approximately 3 months provided that unforeseen circumstances do not arise.

Following completion of the investigation, an anonymised draft report will be prepared by the investigation team outlining the chronology, findings and recommendations. All who participated in the process will have an opportunity to give input to the extracts from the report relevant to them to ensure that they are factually accurate and fair from their perspective.

Staff from the hospital will also have an opportunity to review the report.

The anonymised Report may be published and may be the subject to a freedom of information request.

Recommendations and Implementation

The report, when finalised, will be presented to the commissioner. The commissioner is responsible for ensuring that an action plan is developed to ensure that recommendations are implemented. The action plan will outline the actions, persons responsible for implementation of each action and an agreed timeframe for implementation. The action plan will provide the basis for monitoring and will be overseen as part of the hospitals service plan monitoring process with the HSE.

Local managers will communicate nationally applicable recommendations to the National Director and National Directors will overseen the implementation of any nationally applicable recommendations.

Reference:

HSE 2012 Guideline for Systems Analysis Investigation of Incidents and Complaints

Signed: Mr. David Walsh
Chief Officer – CHO7

Date: 30/3/15

Appendix 2. Expert Report – Professor Fionnuala McAuliffe, Consultant Obstetrician and Gynaecologist, Maternal and Fetal Medicine Specialist.

Medical Report on Shauna DOB 13th September 1991) and Baby Joshua Keyes DOB 28th October 2009 (deceased)

Cornelia Stuart
Regional QPS Manager DNE,
Quality and Patient Safety
HSE, Dublin North East
Swords Business Campus
Balheary road,
Co Dublin
19th August 2015

Dear Ms Stuart,

Thankyou for asking me to opine on the management of the pregnancy and delivery of Ms. Shauna Keyes in 2009. I have based my report only on the photocopied medical records provided to me from your good self.

CLINICAL EVENTS

Ms Keyes was a 17 year old single woman living with her mother & brother when she booked in her first pregnancy at Midland Portlaoise Hospital Maternity unit on 13th July 2009. This was an unplanned pregnancy and she had been using Implanon when she conceived. This was removed on the diagnosis of pregnancy on 18th May 2009.
She was uncertain of her last menstrual period and her pregnancy was dated from an ultrasound at 21 weeks giving an estimated due date of 25th October 2009.
She had previously attended the Mental Health Services with a history of bipolar disorder and had been on Prozac which was stopped in December 2008 and on Lamictal from March to May 2009. She had a tonsillectomy in the past.

She was seen in the antenatal clinic at the following gestations: 24, 34, 36+1. Satisfactory maternal and fetal wellbeing is recorded at these visits.
At 38+1 gestation blood pressure was noted to be increased at 127/97 and 134/89 and aldomet 250mg twice daily was prescribed. Blood tests were normal (Full blood count, liver and renal function).

At two subsequent antenatal visits satisfactory maternal and fetal condition is recorded with blood pressure being in the normal range.
Her weight was 104 kg on 13.7.09 and 112.5Kg on 19.10.09 at the end of pregnancy at 39+1 gestation.

Antenatal admissions

Ms Keyes was admitted at 22 weeks gestation with vomiting and lower abdominal pain on 25th June 2009. Fetal ultrasound was satisfactory and she was discharged home well the following day on 26th June 2009.
Ms Keyes was admitted at 28 weeks gestation on 8th august 2009 with a history of light vaginal bleeding. Fetal monitoring was satisfactory; the placenta was upper and was discharged home well the following day on 9th august 2009.
Ms Keyes was admitted at 34 weeks on 15th September 2009 with pain under her ribs, back pain and urinary frequency. A diagnosis of left pyelonephritis was made and treated with intravenous Augmentin and intravenous fluids. CTG was normal. She was discharged home well on 16th September.
Ms Keyes was admitted at 38 weeks gestation on 13th October 2009 with a gush of fluid. CTG was normal and no evidence of rupture of membranes was found and she was discharged home later that day.

Admission for delivery

27th October

On 27th October at 6.30 am Ms Keyes was admitted by ambulance with history of spontaneous rupture of membranes and uterine contractions. CTG was normal
07.15 vaginal examination revealed that labour was not established
12.00 decision made to transfer to labourward for oxytocin induction of labour
15.00 transferred to labour ward
16.00 epidural sited. CTG normal.
16.00 Oxytocin commenced 10iu in 1L of NaCl was commenced at 30ml/hour.
17.00 oxytocin increased to 90ml/hr
17.15 decelerations noted on CTG at 90 ml/hr of oxytocin and registrar contacted and oxytocin stopped. Advice given if decelerations continue contact consultant Obstetrician
18.00 CTG normal with accelerations and no decelerations and liquor clear, oxytocin off.

18.15 discussed with consultant on call and in view of normal CTG oxytocin recommenced at 10 ml /hr and to increase by 10ml/hr every 10 mins.

18.20 cervix 2 cm dilated

19.15 oxytocin now at 70ml/hr

19.35 top up epidural given, oxytocin 90ml/hr

20.15 oxytocin now at 130ml/hr, IV benzylpenicillin given.

20.40 oxytocin now at 150ml/hr, accelerations noted and CTG satisfactory

21.05 discussed with registrar, for VE at 24.00 oxytocin at 170ml/hr

21.30 oxytocin at 180 ml/hr, early decelerations noted

22.50 VE fully dilated with blood stained liquor

23.20 reviewed by registrar, VE rim of cervix, decelerations noted on CTG with good variability, plan to re-examine in 30 mins. Reduce oxytocin to 120ml/hr

23.40 oxytocin reduced to 90ml/hr

23.45 reviewed by registrar, decelerations noted, cervix unchanged on vaginal examination. Discussed with consultant on call and decision made for delivery in theatre by CS. Oxytocin stopped

23.50 FH 150 BPM

28th October

00.15 spinal anaesthetic performed

00.20 FH 130-140 BPM

00.36 male infant born flat and handed to paediatric team, weighing 4145gr at 40+3 weeks gestation.

The indication for CS was recorded as failure to progress in the first stage of labour and non-reassuring CTG. A large volume of meconium grade 1 was noted and the baby was positioned occiputo posterior. Baby was noted to be flat and handed over to the paediatricians and a request was made to call the paediatric registrar and to inform the consultant on call. Blood loss was 700ml and the CS appears to have been straightforward. Maternal blood pressure was recorded as normal during the CS without evidence of hypotension.

Post-mortem: findings consistent with intra-uterine and intra-partum acute anoxia. There was no evidence of inflammation nor infection in the lungs. Placental histology is reported as essentially normal with no evidence of placental disease nor infection.

Other investigations:

28th oct 2009: HBA1c 5.3% (4.9-5.9 normal range), TORCH screen negative

15th Oct 2009: glucose 4,3 (3.5-7.8 mmol/L)

5th January 2010. Consultant Paediatrican and consultant obstetrician met with Ms Keyes, her partner and the maternal grandfather of Joshua to discuss the circumstance around Joshua's birth. There is a very detailed note on how queries were handled and discussed. This meeting appears to have been carried out in a professional manner.

19th January 2010. Consultant Paediatrican, Consultant obstetrician and CNM3 senior midwife met with Ms Keyes and her partner. Discussion again was had regarding management of Joshua following his death. This meeting again appears to have been carried out in a professional manner.

OPINION

The pregnancy for Ms Keyes was complicated by mild pregnancy induced hypertension requiring treatment with aldomet at 38 weeks gestation, otherwise the antenatal course relatively straightforward.

Following rupture of membranes at 40+2 weeks gestation labour was induced with oxytocin which would be standard practice and Ms Keyes received IV benzylpencillin during labour to prevent ascending infection with group B streptococcus.

The management of the labour was appropriate until 21.30. The oxytocin dose was appropriate and it was stopped initially 17.17 when the CTG was noted to have decelerations. It was then re-commenced when the CTG normalised.

Failure to correctly interpret the CTG

From 21.30 onwards decelerations were noted on the CTG. However there was a failure to appreciate that the CTG was abnormal from 21.30 onwards and no appropriate action was taken; in terms of stopping the oxytocin or performing a fetal blood scalp sampling (FBS) or considering delivery by CS. I note that the midwife who had correctly identified the CTG abnormalities at 17.15 and acted upon them had finished work and had handed over to another midwife was now caring for the patient.

When a CTG is abnormal in labour fetal blood sampling can be an appropriate method of obtaining information on oxygen level of the baby in terms of scalp pH. If this value is less than 7.20 then delivery should occur within 30 minutes. If the pH is greater than 7.25 then this is normal and labour can continue, though the scalp sampling should b repeated if the CTG remains abnormal with decelerations.

The registrar who reviewed Ms Keyes at 23.20 failed to appreciate that the CTG required immediate attention in terms of fetal blood sampling or delivery by CS. A plan was made to repeat the vaginal examination after 30 mins.

Delay in delivery of the baby

At the time of the repeat vaginal assessment the registrar again failed to appreciate that the CTG required immediate attention. This is indicated by the fact that the indication for the CS was recorded as both failure to advance and fetal distress. Failure to appreciate that the CTG was abnormal likely resulted in a 51 minute interval between decision for CS to delivery. During this time the fetus was monitored intermittently with fetal heart auscultation, the baby was not continuously monitored during this time in theatre. Had fetal distress been correctly identified it is likely that the CS would have been performed in a shorter period of time.

Baby born in very poor condition

The baby was then delivered in very poor condition which was unexpected given that the fetal heart was recorded as 135-140 BPM prior to the CS. Given the CTG recordings available and the fact that the fetal heart was recorded within the normal range prior to delivery (110-160BPM) the baby's condition was much poorer than one might have expected. While it is accepted that the CTG was abnormal from 21.30 one would not have expected a baby in such poor condition. Antenatal fetal compromise can result in the delivery of a baby in much poorer condition than expected, however from the medical notes supplied, no evidence of antecedent compromise is found from placental examination nor from maternal blood testing following delivery (no evidence of maternal diabetes, maternal infection nor fetal infection). Oxytocin was stopped once the decision to deliver was made. Therefore one can assume that the fetal condition deteriorated further during the 50 mins between decision to delivery and the CS.

Postnatal care

The family expressed concern about the time they spent with Joshua following his passing and the fact that Ms Keyes was unable to change him and take him out of the coffin. In circumstances of a perinatal death staff should make every effort to facilitate family's wishes and requests.
Ms Keyes and her family met with 2010. Consultant Paediatrican and consultant obstetrician on 5th January and again on the 19th January 2010. There is a very detailed note on how queries were handled and discussed. This meeting appears to have been carried out in a professional manner.

CONCLUSION & RECOMMENDATIONS

Overall review of this case suggests that the perinatal death was caused by intrapartum hypoxia which was exacerbated by the administration of oxytocin in the absence of correct interpretation of electronic fetal monitoring. The following recommendation are made.

1. Staff training on the interpretation of CTG and regular training should be undertaken by all members of staff involved in the management of fetal care.
2. Immediate access to fetal blood sampling (FBS) if CTG is non reassuring. This would allow a relatively accurate assessment of fetal status.
3. Training on interpretation of fetal blood sampling results. This is important to ensure that appropriate management of the case is carried out following a FBS result
4. Training on oxytocin administration and consideration for switching it off in the presence of fetal distress.
5. Audit of time from decision to do CS to CS being performed, each unit should record decision to delivery interval in the cases delivered by emergency CS so that factors resulting in a delay can be identified and addressed. Decision to delivery interval of 30 minutes should be possible for cases of suspected fetal distress.
6. Regular audit (at least monthly) and multidisciplinary discussion of neonates born with acidotic pH and hypoxic ischemic encephalopathy. This would allow staff to discuss and learn from these cases.
7. Appointment of a dedicated bereavement midwife. A dedicated bereavement midwife would assist in the management of families following the death of a baby and facilitate the parents' specific requests in regard to the time they can spend with the baby.

I trust that this information is of assistance. Please contact me if you require further elucidation.

Yours sincerely,

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Appendix 3. Expert Report – Dr John Murphy, Consultant Neonatologist.

Re. Shauna Keyes and Baby Joshua Keyes DOB 28/10/09 (deceased)

Dear Ms. Stuart,
Thank you for your letter 2/9/14 requesting a medical report on the case of Shauna Keyes and her baby Joshua Keyes. In the letter you have requested that I review his condition at birth and the resuscitation measures administered to him. My report is completely based on the photocopied medical notes supplied to me.

Obstetric Background:
Shauna Keyes was aged 17 years, DOB 13/9/91. Her LMP was 1/11/09 but her dates were uncertain. She had bipolar depression and attended the mental health centre in Tullamore.
She had 3 antenatal hospital admissions during the pregnancy. On 26/6 she was admitted with lower abdominal pain. On 8/8 she was admitted with PV bleeding. On 15/9 she was admitted with pain, urinary frequency and was treated with antibiotics for pyelonephritis.
She was admitted in labour on 27/10/09, the details being as follows.

27/10- 06:30: Admitted by ambulance with history of SROM at 03:00 Contracting since that time. CTG normal. Transferred to the ward.
27/10- 14:30: Syntocin drip ordered.
27/10- 15:00: Transferred to Labour Ward. Clear liquor draining.
27/10- 16:00: Epidural sited. Syntocin infusion continuing
27/10- 17:15: Late decelerations noted since Syntocin increased to 90 mls/hour. Syntocin discontinued at 17:17
27/10- 18:15: Syntocin recommenced as CTG stable
27/10- 23:15: CTG variability good, having variable decelerations.
27/10- 23:45: Still having variable decelerations. Decision to perform emergency caesarean section. The reason stated for the caesarean section was 'failure to progress in 1st stage and non-reassuring CTG.
27/10- 23:46: Theatre contacted

Caesarean Section operation notes:
Low transverse incision.
Grade 1 meconium, liquor volume++

OP. Cephalic baby delivered.
Baby flat handed over to Paeds
Asked to call Paeds Registrar
Asked to inform Consultant A.
Keep placenta---to go for histology
I couldn't any record of cord blood gas results. Presumably they weren't taken.

Condition at Birth and the Resuscitation:

APGAR Score

Parameter	1Min	5Mins
Heart Rate	1	0
Respiratory Rate	0	0
Muscle Tone	0	0
Reflex Irritability	0	0
Colour	0	0
Total	1	0

The infant was born at 00:36 on 28/10. The birth weight was 4.415 Kg. The infant was in very poor condition at birth. There was a slow heart rate approximately 60/min. There was no respiratory effort, no muscle tone, no reflex irritability and poor colour ie pallor. The total APGAR score was 1. At 5 mins there was no heart rate, no respiratory rate, no muscle tone, no reflex irritability and poor colour. The total APGAR score was 0 at 5 mins.

Paediatric SHO account of the resuscitation: 'Called to attend routine caesarean section by midwife. Was informed that mother was primiparous, baby had a high head.----Midwife informed me that there were a few variables on CTG but nothing of concern. (She states that the infant was born at 00:39 but the caesarean section note states 00:36). The baby was brought to the resuscitaire---- I attempted intubation as meconium was present and baby was flat----- Cords visualized, no meconium visualized---- Intubation failed so gave PEEP at 20 secs-----checked heart rate 60 bpm----

CPR commenced at 1 min-----APGAR score 1 at 1 min (I for heart rate)----SCBU arrived who took over chest compression from midwife-----CPR and PEEP continued until Registrar arrived at 3 mins and then led the resuscitation.

Paediatric Registrar account of the resuscitation: I was called to the operating theatre for an emergency caesarean section------I arrived at 3 mins of life-------a baby boy was on the resuscitation table receiving O_2 via mask and neo-puff and chest compressions by the SHO on-call and SCBU nurse-----He was flat, floppy, pale white, not moving, with no respiratory effort------We continued giving 100% 0_2 via neo puff, pressure----Endotracheal intubation attempted but there was no air entry in the chest—tube was removed and neo-puff resumed with chest compressions-----ET was successfully sited at 7 mins of life-----100% 0_2 was continued at a pressure of 20/4-----Colour remained pale white, floppy, with no movement, and no respiratory effort-----APGAR was still 0 at 10 mins

Paediatric Consultant account of the resuscitation: The consultant Paediatrician was called by the SHO at 00:46am. She went immediately to the operating theatre. She arrived at 00:55 am. Her initial assessment was as follows---hypotonic, white in colour, no response to stimulation, heart rate <60 bpm receiving cardiac compressions, intubated receiving IPPV via neopuff, monitors attached, heart rate>100 with compressions, sats reading >80%, 20 mins of age.
Adrenaline given via ET tube. Heart rate >100bpm for 2-3mins then decreased. Cardiac compressions resumed. UVC attempted x2- unable to pass, vessels constricted.
Second dose of adrenaline given via ET. Heart rate responded >100bpm.
Baby transferred to SCBU at 35 mins of age.
In SCBU---Heart rate 80bpm, Sats 60%, capillary refill time >4secs
Interosseous needle inserted left tibia and given a saline bolus 20 mls/kg followed by adrenaline 0.1ml/kg. Cardiac compressions continued
At this stage 55mins old---pupils fixed and dilated, no gag response, flaccid.
With full agreement of the team all attempts at resuscitation were discontinued. Baby died at 1:36am
Parents informed by the consultant obstetrician and paediatrician.

Staff nurse account of the resuscitation: At 00:40 am I received a call from theatre to come immediately following the delivery of a flat baby,

emergency CS for FTA. Term male infant, BW 4.14Kg, APGAR 1 @ 1 min, 0 @ 5 mins.
On arrival infant was on the resuscitaire receiving IPPV via neopuff by SHO and getting chest compressions by midwife.
Colour pale, white—floppy---no spontaneous respirations------aqpex 60bpm---
Took over cardiac compressions and asked SN (staff nurse) to attend. I confirmed that both the registrar and consultant had been contacted. The registrar arrived and successfully intubated the baby. Adequate ventilation maintained with neopuff and chest compressions.
Following arrival of the consultant at 16 mins, apex noted 60 bpm. First dose of adrenaline 0.3mls at 20 mins of age---apex >100bpm for 2-3 mins and then decreased.
Unsuccessful attempts to site UVC or peripheral IV lines.
2nd dose of ET adrenaline given at 25 mins of age
Infant transferred to SCBU.
Interosseous needle inserted----administered saline and adrenaline.
Further doses of adrenaline given.
Resuscitation discontinued, baby died at 01:36am at age 57 mins.

Coroner's Autopsy: Brain histology----pattern reflects acute anoxia. Abundant anoxic congestive haemorrhages of meninges, subarachnoid and of residual germinal matrix with dilated white matter. No evidence of recent or old neuronal necrosis or leucomalacia.
Final Diagnosis---
Normally formed, term gestation, newborn infant.
Intrauterine and intrapartum anoxia unresponsive to resuscitation.
No placental or other predisposing disease identified.

Consultant paediatrician's meeting with baby Joshua's parents to discuss the postmortem findings on 5/1/2010: There is a detailed note of meeting between the parents and the paediatrician. The findings of the post-mortem were communicated and the parents questions answered. Many of the questions asked related to the pregnancy and labour rather than the baby's resuscitation.
The parents were upset by a number of issues after the baby's birth.
The baby's coffin was too small-----he was left in the clothes from SCBU----Shauna was not allowed to take her baby out of the coffin----she was only given limited time with the baby------she was told that she would get

handprints, footprints, a lock of hair but only got a footprint----the booklet was filled in----the parents didn't see baby until after they returned to the postnatal ward.

General Comments on the Case:
This is the case of a term infant who was born in very poor condition. There are 4 accounts of the infant's clinical status at delivery (SHO, Registrar, Consultant, Staff Nurse) and the resuscitation measures administered to him. The 4 descriptions are similar and correlate closely with each other.
In summary the only sign of life was a slow heart (60 bpm) less the half the expectant normal heart rate. The infant was white, no respiratory effort, flaccid, and no response to stimulation.
The baby had not been expected to be so clinically compromised. The SHO note indicates that she was called to attend the caesarean section because of failure to advance. At that time there wasn't a sense that the baby was likely to be critically unwell.

When assessing a neonatal resuscitation the process is A-airway, B-breathing, C-Circulation, D-Drugs.

The SHO assessed the infant after birth and documented that the only sign of life was a slow heart rate <100 bpm. She commenced resuscitation with mask and neo-puff. She appreciated that the heart rate was 100 bpm and commenced cardiac compressions. She attempted intubation but when this was not successful she immediately reverted back to mask and neo-puff ventilation. She called for the Registrar.

The Registrar arrived at 3 mins and took over the resuscitation. He intubated the infant but was not happy with the air entry. He removed the tube and shortly afterwards successfully intubated the infant by 7 mins. The ventilation and cardiac compressions were continued until the consultant arrived.

When the consultant arrived she reassessed the infant's condition. She noted that ventilation and cardiac compressions were in progress. She administered adrenaline via the ET tube on 2 occasions. The only response was a transient increase in heart rate lasting 2-3 mins. She transferred the infant to the SCBU and inserted an interosseous needle and administered

saline and adrenaline. These further measures did not produce any clinical response. The resuscitation was abandoned at 55 mins of age.

The consultant went to see the parents and informed them of the baby's death. She subsequently met again 2 months later to discuss the findings of the coroner's post-mortem report.
At this meeting the parents expressed dissatisfaction about a number of the arrangements after the baby's death. The points raised were the time with the baby was too short, they weren't allowed to take the infant out of the coffin, the coffin was too small, the infant wasn't dressed in fresh clothes, and personal memorabilia including lock of hair and hand prints.

Specific Points:
Initially the SHO attended the caesarean section on her own. It appears from the notes that it was anticipated that it was going to be a section for failure to advance rather than a neonatal emergency. She coped satisfactorily with the unexpectedly flat infant. She stayed with the baby throughout and called for senior help. The basic A-airway, B-breathing, and C-circulation was immediately instituted. Her failed attempt was understandable. It is a difficult procedure and very few SHOs have the experience and skill to undertake it successfully. The important point is that she reverted back and continued with mask and neo-puff ventilation.

The Registrar arrived quickly and was present at 3 mins of age. He intubated the baby at the second attempt at age 7 mins. This was an acceptable standard. Emergency intubation is technically difficult and in over 50% of cases it requires more than one attempt. Secondly, the baby was intubated within 10 mins of birth, which is a reasonable standard.

The Consultant arrived 9 mins after been called the SHO. Following her arrival she took over the resuscitation and concentrated on the administration of ET adrenaline and subsequently interosseous adrenaline and saline.
She communicated with the parents immediately after the baby's death and subsequently after the post-mortem results became available.

The parents expressed reservations about the co-ordination and arrangements made for the infant after the birth.

Summary and Recommendations:

- The resuscitation measures administered to baby Joshua were satisfactory. All 4 accounts-SHO, Registrar, Consultant and Staff Nurse provided a clear picture of the baby's condition and the resuscitation measures applied. He was profoundly collapsed at birth and unresponsive to all the resuscitative attempts. His poor condition was such that there was no chance that he would respond to resuscitation.

- In general the taking of cord blood gases at emergency caesarean section is useful. I am unsure what the obstetric/ midwifery policy is about doing cord gases. Although they are not central to a resuscitation, they are helpful in the assessment of the infant's condition and can inform the management. In particular if the infant was profoundly acidotic, it would have been an additional indication that the resuscitation was going to be unsuccessful.

- The arrangements made after the baby's death appear to have been incomplete. The parents expressed a number of reservations about how matters were handled. It is an activity that could be improved upon relatively easily. It would be an advantage if a midwifery bereavement officer was available in all Irish maternity Units to lead and supervise the arrangements for neonatal deaths, stillbirths and miscarriages.

- On the other hand, the meeting between the paediatrician and the parents was initiated as soon as the post-mortem report became available. Her account in the notes indicates that she communicated all the facts of case to them in a professional manner demonstrating both empathy and sympathy.

I trust that this report is helpful

Kind regards
Yours Sincerely

Dr. John F. Murphy
Consultant Neonatologist
The National Maternity Hospital
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Dublin 2

Appendix 4. Oxytocin Infusion Regime for the first and second stage of labour Midland Regional Hospital Portlaoise.

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Health Service Executive,
Baile Átha Cliath & Lár Laighin,
Dublin Mid-Leinster,
Midland Regional Hospital at Portlaoise,
Co. Laois.

Telephone (057) 8621364
Fax (057) 8622986

Oxytocin Infusion Regime for first and second stage of labour.

ARM: to be done when the cervix is favourable (Bishop Score >5.)

Generally, except in exceptional circumstances, prostin is not used to induce labour in women who have had a previous caesarean section. (1 mg Prostin may be given following discussion with the Consultant.)

Oxytocin dose: Primigravid – 10 Units.
Multiparous(<5) – 5 Units
Multiparous(>5) – 2.5 Units.
Previous Caesarean Section – 2.5units.

Oxytocin infusion rate in the first stage of labour.

- Start at 30mls per hour.
- Increase by 30 mls per hour every 30 mins to maximum of 180mls per hour. (as used in RHD and CWH.)

Oxytocin infusion rate in the second stage of labour.

- Start at 30 mls per hour.
- Increase by 30 mls per hour every 5 minutes to maximum of 180mls per hour.

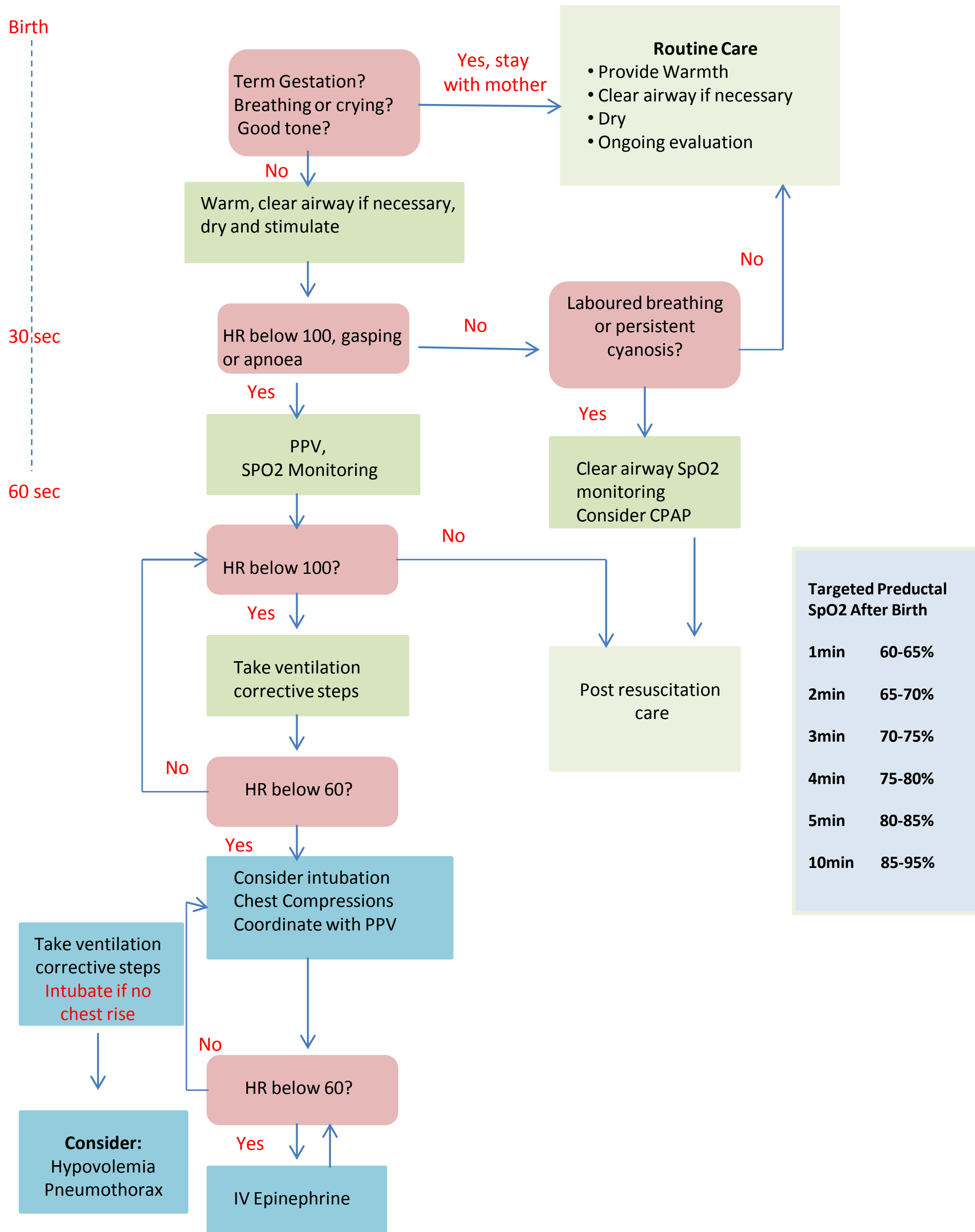
In some cases it may be appropriate to infuse the oxytocin at a slower rate. The rate should by prescribed and recorded in the case notes.

All INDUCTION MUST BE DISCUSSED WITH THE CONSULTANT.

Dr. Miriam Doyle Mr. Hosam Dr. Corristine.

18/07/2007

Appendix 5. Newborn Resuscitation Algorithm.



Kattwinkel J et al. Pediatrics 2010;126e1400-e1413

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