B192/14

2015FAI10

(to be completed by Mrs Cranston)

SHERIFFDOM OF NORTH STRATHCLYDE AT KILMARNOCK

Inquiry under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976

DETERMINATION

by

M Shirley Foran, Sheriff of North Strathclyde at Kilmarnock

Following an Inquiry held at Kilmarnock Sheriff Court on 26 to 30 January 2015, 2 to 5 February 2015, 9 to 10 February 2015, and 16 February 2015

into the death of ELIJAH STIRLING, born 14 December 2010

who resided at XXXXXX

KILMARNOCK : 19 March 2015

The Sheriff having, on various dates in January 2015 and February 2015, held an Inquiry under the Fatal Accidents and Sudden Deaths Inquiry (Sc) Act 1976 into the circumstances of the death of Elijah Stirling, and having considered all the evidence adduced and submissions thereon, Determines as follows:

[1] In terms of Section 6(1)(a) of the Act, that Elijah Stirling, born on 14 December 2010, and residing at XXXXXX, died within the Accident and Emergency Department of Crosshouse Hospital, Kilmarnock at 05.45 am on 20 May 2011.

[2] In terms of Section 6(1)(b) of the Act, that the cause of death was –

(i) Bronchopneumonia,

(ii) Hypoxic-ischaemic encephalopathy,

The severe encephalopathy which caused his death arose as a result of acute severe ischaemic insult in the short period before his delivery at 22.15 hours on 14 December 2010 in Crosshouse Hospital, Kilmarnock, when his mother's uterus ruptured.

[3] In terms of Section 6(1)(c) of the Act, the death might have been avoided if Elijah Stirling had been delivered by Caesarean section on 14 December 2010 by 19.45 hours at the latest.

[4] In terms of Section 6(1)(e), other facts relevant to the circumstances of the death are –

(i) Those providing ante-natal care to women considering vaginal birth after Caesarean section (hereafter VBAC) should discuss and record the risks relating to the pregnancy and birth, the risks and benefits of VBAC versus Caesarean section (hereafter C-section) and the planned mode of delivery.

(ii) Where the drug Syntocinon is to be employed in inducing a VBAC birth, there should be set a maximum level of infusion and a maximum period of time of administration of the drug, beyond which Consultant authorisation is required.

[5] I decline to make any findings in respect of Section 6(1)(d).

Note

At the Inquiry the family was represented by Ms Davie, Advocate, NHS Ayrshire and Arran Health Board by Mr Bowie, QC, and Dr Riad by Mr Stewart, Solicitor.

I heard evidence over 11 days in this case. Evidence was led by the Procurator Fiscal, Ms Spiers from –

Jacqueline Kennedy, the deceased's mother,

Dr Henry Gordon Dobbie, BSc Hons, MD FRCOG, Consultant Obstetrician

Dr Lucy Helen Michie, MBChb, MRCOG, MFSRH, ST5 Trainee in Obstetrics and Gynaecology,

Dr Mohammad Riad, Clinical Research Fellow and Registrar,

Dr Sham Konamme, MBBSc, FRCOG, Consultant in Obstetrics and Gynaecology,

Dr Gillian Irvine, MBChb, FRCOG, MD, Consultant in Obstetrics and Gynaecology,

Dr Anaaprna Pandravada, MBBSc, DGO, MRCOG, Registrar,

Marian Dodd, Community Midwife,

Susan Lynch, Midwife,

Lynn Wilson, Staff Midwife,

Laura Muir, Midwife and Labour Ward Co-Ordinator,

Emily McFadzean, Midwife,

Shannon Pacitti, Trainee Midwife,

Helen Ryrie, Midwife and Labour Ward Co-Ordinator,

Dr Jane Elizabeth Ramsay, MBChB, MRCOG, MC, Consultant Obstetrician,

Dr Rhona Grace Hughes, BSc (Hons), MBChb, MD, FRCOG, FRCPE, Consultant Obstetrician,

For the family evidence was led from –

Jean McConville, PDDips, BSC (Hons), DPSN, RM, RGN,

For NHS Ayrshire and Arran evidence was led from –

Dr Julia Sanders, PHD, RGN, RM, LLM, MPH, Consultant in Midwifery

I do not propose to rehearse all of the evidence given by every witness.

Productions were lodged by the Procurator Fiscal, by the family, and by NHS Ayrshire and Arran. Submissions were made by the Crown, and each of the aforesaid parties.

A Joint Minute was tendered by the parties addressing Section 6(1)(a) and (b) of the Act.

Legislative background

Fatal Accident Inquiries are statutory proceedings governed by the Fatal Accident and Sudden Deaths Inquiry (Scotland) Act 1976. The Sheriff's duty is set out in Section 6. At the conclusion of the evidence, and having heard submissions thereon in terms of Section 6(1) the Sheriff must determine –

(a) Where and when the death, and any accident resulting in the death, took place,

(b) The cause, or causes, of such death or any accident resulting in the death,

(c) The reasonable precautions, if any, whereby the death, and any accident resulting in the death, might have been avoided,

(d) The defects, if any, in any system of working, which contributed to the death, or any accident resulting in the death,

(e) Any other facts which are relevant to the circumstances of the death.

Accordingly, in addition to determining the circumstances of the death under inquiry, the focus of the Court's determination should also be forward looking, having regard to future

public safety. This is achieved by examining whether there are any lessons to be learned from the circumstances of the death whereby future accidents or deaths may be avoided. This is the principal ethos of a public inquiry of this nature. It is not the purpose of an FAI to establish fault, at least not in the legal sense involving such concepts as duty of care, and reasonable foreseeability. Foresight is irrelevant in an FAI. However, hindsight is a legitimate and necessary perspective if the inquiry is to fulfil its purpose.

Although the evidence led at an inquiry may be detailed and wide ranging in an effort fully to inform relevant parties, it does not follow that every matter explored should be included in the Sheriff's determination. Only those matters which properly fall under the provisions of Sections 6(1) of the Act are relevant.

History

From the evidence led before me, I take the following to be the history of relevant events leading to the death of Elijah Stirling which I set out in detail in support of my determination.

[1] Elijah's mother was Jennifer Kennedy. Miss Kennedy presented at 20 weeks of pregnancy. This was Miss Kennedy's eighth pregnancy (making her multi-parous in medical terms). She had miscarried twice. Of her five previous births her first child had died of cot death in 1987. Her fourth child was delivered by C-section in 2008 at 34 weeks gestation following the spontaneous rupture of fetal membranes at 20 weeks.

Her fifth child was born at term, by vaginal delivery, but intra-uterine growth was poor. Apart from the C-section performed at the fourth birth, Miss Kennedy had given birth quickly and without incident. Her babies tended to be small. At the time of Elijah's pregnancy and birth she was 42 years of age, and a smoker.

[2] All of these factors made Miss Kennedy's pregnancy high risk. The risks included still birth, and uterine rupture. Accordingly, Miss Kennedy was correctly identified by the obstetric team as being a "red pathway" pregnancy. This meant that her care would be Consultant-led.

[3] Miss Kennedy attended a booking appointment within Crosshouse Hospital Maternity Unit on 29 July 2010. She was under the care of Consultant Obstetrician Dr Gordon Dobbie, but was attended on that occasion by Dr James May, Registrar. A scan put gestation at 20 weeks and 5 days (giving an estimated date of delivery of 11 December 2010), and disclosed concerns as to the position of the placenta and the baby's growth. Follow up scans were arranged at 32 and 36 weeks. By letter dated 6 August 2010 (CP 10, p 110), Dr May wrote to Miss Kennedy's GP, and amongst other matters relayed Miss Kennedy's wish for a vaginal delivery.

Booking appointments are longer than subsequent ante-natal appointments. The purpose is to provide time for the full noting and assessment of the woman's medical and previous obstetric history. Discussion of mode of birth would be expected to be discussed at that time. I am satisfied that Dr May discussed with Miss Kennedy her preferred mode of birth. Otherwise there would have been no reason for him to write

to her GP in the terms that he did. There is no evidence as to whether Miss Kennedy was given information as to the risks relating to her pregnancy, the benefits and risks of VBAC versus C-section, or the option of an elective C-section. Miss Kennedy recalls no such discussion.

[4] Following the booking visit, and until admission to Hospital on 14 Dec 2010, Miss Kennedy was seen nine times by community midwives. Her nominated midwife was Marion Dodd. A booklet entitled "Pregnancy Record" is made available to every expectant mother. A copy of Miss Kennedy's is lodged. (CP10, p 197-231). The Pregnancy Record includes sections for discussion which can be completed by the midwife and/or the woman, including preferences for labour and birth. Although midwife Dodd would normally discuss risks and the mode of birth, she would also normally record these discussions. She did not do so. Miss Kennedy recalled no such discussion.

[5] I am satisfied that midwife Dodd discussed with Miss Kennedy her preferred mode of birth, otherwise there would have be no reason for her to record Miss Kennedy's preferred position for giving birth (p226), and her hope to go into the midwifery unit, and "keep everything as natural as possible" (p227). There is no evidence that Miss Kennedy was given information, however, as to the risks previously referred to. Midwife Dodd was aware that as a red pathway patient, Miss Kennedy's birth plan would ultimately be decided between Miss Kennedy and her Consultant. She was also aware that Miss Kennedy was not a suitable candidate for delivery in the midwifery unit.

[6] Miss Kennedy was seen at the hospital ante-natal clinic on 4 November 2010 by Dr Michie, Registrar. Dr Michie wrote to Miss Kennedy's GP that day (CP10, p110) saying among other things that Miss Kennedy "remained keen for a trial of vaginal delivery", and that she was aware "given her history of previous C-section, that should she not go into spontaneous labour [the obstetric team] would be wary of inducting (sic) her". I am satisfied that Dr Michie obtained confirmation of Miss Kennedy's preference for a vaginal birth, and alerted her, to a degree, to the different character of inducing labour after a C-section. Otherwise there would have been no reason for Dr Michie to write to the GP in the terms that she did. However, it is not possible to draw a safe conclusion as to what risks were discussed with Miss Kennedy, and whether she was given the option of elective C-section.

[7] It was clear that all staff who dealt with Miss Kennedy were fully aware of the various risk factors present. It is possible that discussions which might otherwise have taken place at these consultations were deferred until there was clarity regarding the position of the placenta, and the baby's growth, that is, until closer to the estimated date of delivery. The chances of a successful vaginal birth stood at 90% (given that Miss Kennedy had an earlier and successful VBAC) but if the placenta remained low in the uterus, vaginal birth would not have been an option at all. It is possible that the staff delivering ante-natal care deferred discussion to the Consultant who would ultimately be responsible for formulating the plan with Miss Kennedy. However, there is insufficient evidence to allow a concluded view one way or the other.

[8] Miss Kennedy was first attended by her Consultant Dr Dobbie on 19 November 2010. Following a scan it was noted that the position of the placenta had improved. Dr Dobbie recorded "Should be ok to try VBAC". He thought that decision had already been taken, and he saw no reason to change it. Vaginal birth was a reasonable option for Miss Kennedy. There were potential significant benefits for mother and baby. He arranged a further scan. As the frequency of scanning was a somewhat unusual event, he explained why he was doing this to Miss Kennedy.

[9] Dr Dobbie saw Miss Kennedy at her request at a clinic on 6 December 2010. A scan that day had disclosed that the placenta was not low lying. The baby appeared to be growing slowly. Miss Kennedy pressed Dr Dobbie to artificially rupture the membranes (ARM) with a view to prompting delivery. The electronic records of that appointment (CP10, p296) note among other things that the findings from the scan were discussed, that Miss Kennedy's cervix was not favourable for ARM and that she had had a previous C-section. She was to be reviewed "on Friday". Miss Kennedy was keen for ARM as she had previously delivered quickly following spontaneous rupture of the membranes. Dr Dobbie counselled her as to the difference between spontaneous and artificial rupture, and advised that it would be better if she went into labour spontaneously. Given her previous C-section, induction would be more difficult. Without going beyond her date he preferred her to wait. He believed she understood.

[10] Miss Kennedy could not comment on this specific appointment and did not remember if her birth plan was discussed. At some stage, and it is not possible to say when, there were some discussions between her and Dr Dobbie. In cross examination by her representative Miss Kennedy was able to say that she had been told that due to her age her risks were slightly higher (although she did not see that as a risk), that there was discussion about her previous small babies, and the number of babies she had had before, the last point leading to a discussion of sterilisation. She told Dr Dobbie that her family was complete, and sought sterilisation after this birth, in the event of a C-section being required. She knew drugs would be used to stimulate labour if needed, that this would "speed up labour but in a controlled way", and that she was not suitable for the direct application of hormone gel (identified by Dr Dobbie as Prostin).

Whilst it is not possible to be clear as to the dates, I am satisfied from the evidence that prior to her admission to the labour ward on 14 December 2010, Miss Kennedy was aware of the plan for a trial of labour, and of vaginal delivery, and that the plan might involve an attempt at inducing birth, that induction might fail resulting in a C-section, and that applicable risk factors were her age, her high parity, and her tendency to deliver small babies. I cannot conclude that she was specifically warned of risks such as stillbirth, or uterine rupture. I cannot conclude that she was offered a clear choice of an elective C-section. Miss Kennedy said that she was not, and in fact, did not know that such an option was open to her. Given her maturity, her significant experience of child-bearing, and the frequent references to and discussion of elective C-section in the

media generally, I find Miss Kennedy's evidence on that point implausible, although she maintained that position.

Dr Dobbie saw Miss Kennedy on 10 December 2010. There is no written record of any discussions with her but Dr Dobbie recorded (CP10, p292) "ARM is possible, though I would prefer spontaneous onset of labour" and "if comes to repeat c/s, wishes sterilisation". That might suggest that the conversations which Miss Kennedy recalled took place on that day, but that cannot safely be concluded.

[11] Miss Kennedy was admitted to the labour ward for induction of labour at 9.30 am on 14 December 2010. The Consultant on duty was Dr Dobbie. She was initially allocated Susan Lynch, an experienced midwife, who handed over to Lynn Wilson, also an experienced midwife, at 1.15 pm. Dr Dobbie attended her and effected ARM at 10.30 am with a plan to review progress in two hours. He hoped ARM would start labour. It did not. At 12.30 pm Dr Dobbie ordered a trial of Syntocinon by i.v. infusion which commenced at 12.47 pm, at an infusion rate of 3 millilitres per hour. Dr Dobbie recorded "Plan - short trial of Syntocinon for couple of hours and review".

[12] Syntocinon is a synthetic hormone employed by way of intra venous infusion to start contractions with the aim of prompting the release of the natural hormone, oxytocin, which controls the contraction of the uterus. Syntocinon is increased incrementally, and the response monitored. It has a short half-life in the body. Once reduced or

stopped the effects are quickly lost within 5-10 minutes. Syntocinon is largely ineffective if fetal membranes are intact.

[13] At this time Dr Dobbie was in the process of retiring, and was working a staged withdrawal rota which reduced his working hours. That day he ended his shift at 12.30 pm, and handed over to Consultant Obstetrician Dr Konamme. He discussed Miss Kennedy with Dr Konamme at handover.

[14] Dr Konamme did not visit Miss Kennedy. He had other duties which took him elsewhere in the hospital. The Registrar on duty was Dr Riad. Dr Riad had 6 ½ years post-qualifying experience.

[15] Dr Dobbie's plan as recorded was not clear. It was variously interpreted as meaning 2 hours, or 2-3 hours, or 3-4 hours. It was interpreted as meaning either a limited period of time on Syntocinon then review, or the aforementioned time range (ie 2 to 4) hours of adequate contractions then review. Either way, Miss Kennedy was not reviewed until 4.00 pm. This did not impact on her care, or on subsequent events.

[16] Whilst the use of Syntocinon in inducing labour in a high risk woman such as Miss Kennedy can only be decided by a Consultant, in the absence of other instructions the augmentation of the infusion is a matter for the midwife. A midwife can stop or decrease Syntocinon at her complete discretion. She cannot increase beyond certain increments or decrease the time intervals laid down in hospital policy.

[17] NHS Ayrshire and Arran had at the time a protocol for the use of Syntocinon in inducing labour referred to as protocol E1. Protocol E1 gave guidance for the standard situation. It was not appropriate for a high risk case such as Miss Kennedy's. Whilst not all midwives attending Miss Kennedy could recall or name this protocol, all knew of the standard practice, and all knew that it was not appropriate for Miss Kennedy, but that a more cautious approach should be adopted. Whereas the standard infusion tended to start at 6 millilitres per half hour, doubling to 12, 24 etc, Miss Kennedy was to start at 3 millilitres and increase in increments of 3. There was some divergence of evidence as to whether the appropriate interval was half hourly or hourly, but in the event nothing rests on that. Syntocinon for Miss Kennedy was commenced at 3 millilitres at hourly intervals. At no time did the augmentation level exceed 3 millilitres, and the maximum infusion achieved in the course of the day was 12 millilitres (and that was for a period of 20-30 minutes only). At no time did intervals fall below 30 minutes.

[18] Whilst on Syntocinon it is important that the baby's heart rate is continuously monitored to assess how the baby reacts, and to ensure it is coping. This is done by way of a cardiotachograph (CTG), in this instance attached externally by a belt around the mother's abdomen.

[19] The CTG tracing is scrutinised for a number of elements, including the baseline (ie, the trend of the fetal heart rate), variability (changes in the heart rate), accelerations (increases in the fetal heart rate, being a healthy sign showing a responsive baby), and decelerations (decreases in the fetal heart rate, showing some pressure on the baby,

and to be monitored). This is a very simplistic summary, to enable the lay reader to make some sense of the medical evidence. The analysis of CTG traces is a sophisticated skill.

[20] It is important to consider a CTG trace as a whole. It is misleading and incorrect to make judgements based on minute to minute, 10 minute to 10 minute, sections (though extreme changes had to be watched carefully, and reacted to if needed). Decelerations were a normal part of the labour process, and in a healthy baby would be followed by a prompt recovery. Poor or slow recovery had to be monitored.

[21] In the normal situation the aim is to achieve 4-5 adequate contractions in 10 minutes with appropriate rest periods between, when the uterus can relax before contracting again. Contractions have to be of adequate strength to do the job of delivering the baby. Whilst the CTG trace picks up the contractions and measures their duration, it cannot measures their strength. The strength of a contraction is judged by the midwife placing her hand on the fundus of the uterus. The mother's input is also sought. For a high risk case such as Miss Kennedy, the aim was for 3-4 contractions in 10 minutes so as not to stress the uterus, given the risk of uterine rupture.

[22] The Syntocinon infusion was increased to 6 mls at 1.47 pm, 9 mls at 2.40 pm, and 12 mls at 3.40 pm. This was cautious augmentation.

[23] At this time, the Registrar responsible for medical care on the labour ward was Dr Riad. He had not been present at the handover between Dr Dobbie and Dr Konamme but understood the plan was a cautious trial of Syntocinon, with review to assess

contractions. He was aware of her risk factors. Dr Riad examined Miss Kennedy at 4.00 pm. Although this was later than the two hour period set by Dr Dobbie, given the cautious administration of Syntocinon in the interim period this was not unreasonable. Dr Riad detected no progress in labour. Miss Kennedy had not experienced any contractions of note. Dr Riad found intact fetal membranes which he ruptured, noting the release of minimal liquor. Syntocinon is largely ineffective where fetal membranes are intact. It is likely Dr Dobbie had not in fact ruptured the membranes earlier.

[24] To allow Dr Riad to perform ARM, Miss Kennedy was placed on her back. This together with ARM can cause a negative reaction in the baby. The fetal heart rate dropped. Dr Riad reduced then stopped the Syntocinon drip at 4.15pm. Fetal heart changes seen between 4.10 and 4.30 were consistent with cord compression caused by the release of amniotic fluid and the mother's supine position. Miss Kennedy's position was changed and the trace improved. Dr Riad wanted to see 20 to 30 minutes of reassuring CTG before recommencing Syntocinon. The fetal heart rate was normal at 4.30 pm. Dr Riad instructed the recommencement of Syntocinon at 5.15 pm at 3mls.

[25] Dr Riad's decision to restart Syntocinon was a reasonable one. It would have been equally reasonable to offer a C-section on the grounds of failure to progress labour at examination at 4.00 pm. He and the midwife believed Miss Kennedy remained willing to attempt labour with a view to a vaginal delivery.

Miss Kennedy's evidence was that at this time, indeed from around lunch time until the dramatic final event, she continuously asked when she would be getting her C-

section. This was not supported by any other witness who attended her, which included three experienced midwives, one trainee midwife, two labour ward co-ordinators, two registrars and one Consultant. Had she asked, it would have been put to the responsible Consultant. Such a choice was a viable and available option. At this time Miss Kennedy was said to be calm and comfortable albeit a bit "fed up".

[26] Syntocinon was increased to 6 mls at 5.45 pm, and 9 mls at 6.20 pm. By 7.00 pm contractions were occurring at the rate of 3-4 in 10 minutes. Miss Kennedy was allowed to attend the toilet and the CTG was discontinued for that purpose. On recommencement of CTG at 7.25 pm 2 deep decelerations in the fetal heart beat were noted. The midwife stopped Syntocinon and called Dr Riad to review.

[27] At 7.45 pm Dr Riad reviewed Miss Kennedy. He felt that the CTG was suspicious. It improved on changing Miss Kennedy's position. Dr Riad fully examined Miss Kennedy, including internal examination. He made detailed notes. He noted contractions of 2 or 3 in 10 minutes. This was not established labour. He found her cervix to be 3 centimetres dilated. He noted the presence of Grade II meconium. He specifically examined for evidence of pending uterine rupture, and found none.

[28] Meconium is fetal waste product. Dr Riad's evidence was that it can be, but is not always, a sign of fetal distress. It can be innocently present in post-date babies. It is graded I to III. Grade II is significant. Its presence requires continuous monitoring. In the present circumstances it could be a sign of progress in labour, and could, therefore,

support a decision to continue to augment with Syntocinon, while carefully monitoring. Having satisfied himself as to the CTG trace, and having ruled out uterine rupture, Dr Riad felt able to recommend a further two hours of Syntocinon.

[29] Dr Riad's evidence was that he presented a choice to Miss Kennedy – the option of a C-section at that time, or a further two hours trial with C-section if no progress - and that she was happy to continue with the trial. He did not record this discussion in the notes. Miss Kennedy had no recall of even any examination by a doctor at this time, far less any discussion.

[30] Dr Riad told the Inquiry that at this time he spoke to Dr Konamme by phone. It is not clear whether he did so having agreed a course of action with Miss Kennedy, or whether he discussed matters with Dr Konamme, and then reverted to Miss Kennedy. Either way, Dr Riad was adamant that he set out the background circumstances to Dr Konamme, and obtained his approval. He did not record that fact on the notes.

[31] Dr Konamme had no recall of any such phone conversation, but confirmed that in the circumstances he would have approved such a plan – had Miss Kennedy agreed – and that Dr Riad had sufficient experience to make such a plan. Although Dr Konamme would have been a little concerned at the presence of meconium, Miss Kennedy was 40 weeks+, and meconium can be normal. If there were no other concerns then it was appropriate to continue. Miss Kennedy had delivered quickly before without complications.

[32] Accordingly, Dr Riad instructed the recommencement of Syntocinon at 7.58 pm. His shift ended at 8.30 pm when he handed over to Dr Irwin, Consultant, and Dr Pandravada, Registrar. He had no further contact with Miss Kennedy.

[33] The midwife's decision to turn Syntocinon off, and to call for Dr Riad at 7.25 pm was correct but between 7.30 and 7.50 pm the CTG again recovered to normal. A C-section was not essential at this time, although progress was slow. There was no more reason now to opt for C-section than there had been all day. It was not clinically unreasonable to continue with the trial of labour. However, more consideration should have been given to offering elective C-section which was justifiable on grounds of failure to progress labour. Miss Kennedy was 42 years old, had 4 children, this was an unplanned pregnancy, and Miss Kennedy had opted for sterilisation. Meconium was present. It could not be said for certain but it is likely that if C-section had been offered at this time Miss Kennedy would have agreed. If the offer had come with a recommendation, it is likely Miss Kennedy would have agreed. If Elijah had been delivered by elective C-section at this time, he would have been delivered in better condition.

[34] At 8.15 pm, following a shift change, midwife Emily McFadzean took over. She was briefed by her predecessor. She increased Syntocinon to 6 mls at 8.35 pm, and to 9 mls at 9.10 pm.

[35] Dr Konamme's shift ended, and he was replaced by Consultant Obstetrician Dr Irvine at 9.00 pm. Dr Irvine reviewed Miss Kennedy at 9.30 pm, and made detailed notes of her findings. Dr Irvine continued the existing approach and arranged to review after

30 minutes. Dr Irvine had in mind to recommend C-section to Miss Kennedy if there was no progress towards birth by the time of her review.

[36] At 9.40 pm Miss Kennedy's contractions were stronger, and for the first time she required analgesia (Entonox). There were 3-4 contractions in the 10 minute period between 9.39 pm and 9.49 pm with good spacing. The CTG showed reassuring features, and no suggestion of fetal hypoxia.

[37] At 9.50 pm (timed per the CTG trace) the fetal heart rate deeply decelerated to 65 beats per minute. Syntocinon was immediately reduced to 6 mls, and the CTG trace was watched for signs of recovery. At 9.56 pm the fetal heart rate recovered briefly to 122 beats per minute, followed by a further deceleration. Syntocinon was turned off.

[38] At this time, at the request of Dr Irvine, Dr Pandravada was present to undertake a review of Miss Kennedy. She carried out a vaginal examination. The advancement of labour and imminence of birth can cause sudden decelerations in the fetal heart rate. No advance in labour was found. There was no real change in the cervix, and thick meconium was draining. Dr Pandravada decided an emergency C-section was required, and sought Miss Kennedy's consent. At this time Miss Kennedy was uncomfortable. Midwife McFadzean was unable to locate the fetal heart beat. Dr Pandravada sought Dr Irvine's help. Dr Irvine attended immediately, and ordered a category one (most urgent) C-section. Dr Irvine tried and failed to find the fetal heart beat between 9.58 pm and 10.07 pm while preparation was being made for transfer to theatre.

[39] In theatre, rupture of the uterus was seen with the placenta protruding through the torn scar of the previous C-section. The baby was delivered and handed to neo-natal staff. Dr Irvine called Dr Konamme in to assist her and the damaged uterus was repaired.

[40] Baby Elijah was delivered by emergency C-section swiftly at 10.15 pm. He weighed 2.045 kilogrammes (4.5 lbs). He was in very poor condition. He spent approximately 5 weeks in the neo-natal unit at Crosshouse Hospital, and subsequently spent time in Yorkhill Hospital in Glasgow. His parents learned to manage his demanding care needs, and were able to take him home and care for him for a time.

Elijah had suffered an acute hypoxic ischaemic insult in the short period before his delivery when his mother's uterus ruptured. As a result he suffered severe encephalopathy which ultimately caused his death.

[41] At about 5.19 pm on 20 May 2011, Elijah became unwell at home and was taken by ambulance to Crosshouse Hospital where he was intubated, and ventilated. There were no signs of spontaneous circulation or heartbeat, and he was pronounced dead at 5.45 am. A post mortem was undertaken at the Royal Hospital for Sick Children, Yorkhill, Glasgow, on 23 May 2011, where the cause of death was ascertained as –

(a) Broncho-pneumonia,

(b) Hypoxic-ischaemic encephalopathy.

Submissions

The parties by Joint Minute agreed that I should make findings in terms of Sections 6(1) (a) and (b) of the Act as I have done. There is no dispute as to these matters.

Reasonable precaution

[1] The Procurator Fiscal submitted that a finding in terms of Section 6 (1)(c) should be made, to the effect that had Elijah Stirling been delivered by C-section, on 14 December 2010, at 19.45 pm, there was a lively possibility his death could have been avoided.

The family broadly adopted the same approach in suggesting that earlier recourse to C-section during 14 December 2010, and at the latest by 19.45 pm might have avoided the death.

Neither the Health Board, nor Dr Riad, would resist such a finding.

An unusual feature of this Inquiry is that the suggested "reasonable precaution" namely, the delivery of Elijah by elective C-section, would have been an option at any time at all on 14 December 2010. The risk factors and Miss Kennedy's personal circumstances would have justified this course of action. However, the particular background circumstances bear scrutiny.

I am satisfied that Miss Kennedy's preference was for a vaginal birth, and that in all the circumstances this was not unreasonable. Indeed the reasonableness and clinical appropriateness of the decision was vouched by a number of witnesses, including the expert witnesses. A C-section was not without its risks. In these circumstances I infer from the evidence that Miss Kennedy would have given induction of labour a reasonable chance to work.

When Miss Kennedy was examined by Dr Riad at 4pm she was comfortable and not in labour. Given that Dr Riad was confident he was only then rupturing the fetal membranes, and given the evidence that Syntocinon is of very little effect with intact fetal membranes, the clock was effectively reset. Both Dr Riad and the attendant midwife believed that they were working with Miss Kennedy to the same end. The resumption of the attempt at inducing labour was a reasonable plan. Dr Riad was sure he had discussed this with Miss Kennedy, and that she was content to proceed. Unfortunately there is no note of those discussions, and no note of an option of a C-section being put to Miss Kennedy at this time. Although Miss Kennedy gave evidence

that she repeatedly asked when she was having her C-section, I have doubts as to how much reliance I can place on this testimony. Miss Kennedy did not recall examination by Dr Riad at 4.00 pm. It is almost certain that the examination she spoke of by a male doctor at 2.00 pm was in fact that by Dr Riad at 4.00 pm. No other witness confirmed her testimony. The midwives in particular looked taken aback and puzzled when this was put to them, and I accept the evidence from all witnesses to fact involved that day, that if Miss Kennedy had raised the question of a C-section, it would have been addressed, since it was an eminently viable option for her. Miss Kennedy herself accepted some difficulties of recall that day, and that she had blanked out some parts. I make no criticism of her at all in recording this. It was a stressful day. Much time has passed. However, in these circumstances I cannot be certain as to the exact content of discussion between Dr Riad and Miss Kennedy. Accordingly, I rely on my earlier findings as to her expectations of, and wish for a straight-forward delivery, and the ongoing clinical reasonableness of this plan, and infer that Miss Kennedy would have accepted Dr Riad's plan, and carried on with induction at this time.

The next review was by Dr Riad at 7.45pm. He was called to attend by midwife Wilson who had concerns about the CTG trace. The Crown expert, Dr Hughes, agreed there were less reassuring signs at 6.40 pm, and around 7.20 pm. However, the CTG thereafter returned to normal. There was no evidence of pending uterine rupture. Dr Riad carried out a thorough examination and felt able to recommend proceeding with induction. Dr Hughes' opinion was that it was appropriate for Dr Riad to continue with the planned vaginal birth if Miss Kennedy was in agreement. There was no more

reason now to suggest C-section than had previously existed. There was nothing on the trace pointing to a need for C-section. However, given that Syntocinon had been running since 12.47 pm, that meconium was present, and taking all of the other risk factors into account, Dr Hughes would have offered the option of C-section with a recommendation. Her evidence was that it was rare for a patient not to accept a recommended course of action. This was an unplanned pregnancy, and if all went well, Miss Kennedy had sought sterilisation, so it would have been her last pregnancy. She had undergone C-section before. Dr Hughes believed that if C-section had been offered, particularly with a recommendation, at around these times, Miss Kennedy would have agreed. Dr Hughes also gave evidence that if Elijah had been delivered at 7.45 pm, he would have been in a much better condition. I accept Dr Hughes' assessment of the situation. This is not to criticize Dr Riad-it was quite clear from the evidence of Dr Hughes that both courses of action were viable. If C-section had been offered it would have been on grounds of failure of induction, or lack of progress in labour. However, the purpose of this Inquiry is to identify whether there was a reasonable precaution whereby the death or any accident leading to the death might have been avoided, and the evidence points to an elective C-section, performed at the latest by 7.45pm, being such a reasonable precaution. Accordingly, I adopt the Crown and family's submission, and have determined accordingly.

[2] The family sought an additional finding under Section 6(1)(c) to the effect that the identification and communication of a clear birth plan for Elijah's delivery, on the

admission of Miss Kennedy to Crosshouse Hospital on 14 December 2010, might have avoided the death.

I do not consider that this is supported by the evidence and accordingly decline to make such a finding.

On admission Dr Dobbie had identified a plan, accepted by all relevant witnesses as a reasonable and clinically appropriate one. Although there was subsequent criticism of short-comings in his communication of that plan, which I accept, the expert evidence of Dr Hughes was to the effect that this did not cause or contribute to Elijah's death.

At or by 4.00 pm, a new clinical scenario presented itself. A new plan was formulated, specified and communicated by Dr Riad. I do not understand there to be any suggestion that Dr Riad's plan was not medically appropriate, known to, or understood by the midwifery staff who were to implement it. I do not understand there to be any suggestion that Dr Riad was not sufficiently experienced to formulate such a plan.

Defect in System

The family also sought a finding under Section 6(1)(d) to the effect that lack of informed consent, and three different Consultants caring for Miss Kennedy throughout labour, were defects in the system of working which contributed to the death.

With reference to the first point, I cannot accept lack of informed consent as a defect in the system causing or contributing to the death, although I have noted some separate concerns later in this determination in terms of Section 6(1)(e). There was an appropriate system in place for information-giving and discussion with medical staff at the booking-in and subsequent ante-natal visits to the Hospital, and with the community midwives. In addition there was a specialist VBAC clinic available (although not utilised here).

On the second point, whilst there are obvious advantages to minimising staff changeovers (the opportunity for consistency and continuity of care, and reduction of failures or errors in communication being examples) there will always be a need for shift changes to occur. Babies are not born to schedule. Whilst there were three Consultants involved on 14 December 2010, Dr Irvine had a very short lived and limited period in charge of Miss Kennedy, and I do not consider that the handover to her caused or contributed to the tragic events which followed so closely on her arrival.

Similarly, I do not consider that the handover between Dr Dobbie and Dr Konamme caused or contributed to the death. However, it is to the credit of the Health Board that they have taken on board the desirability of minimising Consultant shift changes, and have implemented changes which provide two significant benefits. I will return to this matter further in my determination, under Section 6(1)(e).

Other relevant Facts

The family invite me to consider other factors relevant to the circumstances of the death in terms of Section 6(1)(e) as follows –

[1] Lack of consideration of the mother's position,

[2] Lack of appropriate and clear regimen for induction, and augmentation of labour in high risk pregnancy,

[3] Communication and actions of care team throughout labour not reflecting the high risk presented in this pregnancy.

Dealing with these in order:

[1] All evidence suggests that all staff dealing with Miss Kennedy were fully aware of her attendant risks, and were experienced and caring professionals. The midwives placed with Miss Kennedy were specifically selected for that role because of their considerable experience. There was no evidence to suggest that they were at any times blasé or careless of Miss Kennedy's situation. Dr Sanders was very impressed by the level of senior medical input and felt that thoughtful, "not standardised", care was provided.

[2] I agree that in the public interest comment can properly be made in relation to the regimen for induction and augmentation of labour in VBAC situations, particularly where the use of syntocinon is employed. I have commented upon this further in my undernoted determination under Section 6(1)(e).

[3] There is no evidence to support the suggestion that the communication and actions of the care team did not reflect the high risks presented in this pregnancy. I will not repeat my observations made in response to the family's first point here, but they are pertinent.

DETERMINATION UNDER S6(1)(e)

I consider it appropriate to make a number of remarks pursuant to Section 6(1)(e) of the Act which for convenience I have placed under specific hearings.

Ante-Natal Care

The Crown submits that it remains unclear whether Miss Kennedy was counselled as to the risks/benefits of VBAC versus C-Section, and whether she was offered the choice of C-section. The family make largely the same observation, albeit under Section 6(1)(d). Both submit that this should be addressed. I consider there to be merit in their observations.

Dr Hughes, Ms McConville and Dr Sanders stressed the need for appropriate information to be given as to the risks and benefits of VBAC, and for the woman to have a genuine choice, based on medical advice.

The witnesses who spoke to Miss Kennedy's ante-natal care were quite clear as to her risk factors, and I have no hesitation in accepting that they understood the consequent implications for her pregnancy and birth. Dr May, who attended Miss Kennedy for her

booking in visit on 29 July 2010, could not be traced to give evidence to the Inquiry, but his letter to Miss Kennedy's GP was spoken to by his colleague, Dr Michie, who noted the reference to Miss Kennedy being "keen on a further vaginal delivery on this occasion". (CP 10 at page 299). Dr Michie took from this that a discussion had taken place. She gave evidence that this was what would be expected at a booking in visit – an appointment deliberately longer in time to permit of information-giving and discussion. She herself reviewed Miss Kennedy, and reported to the GP (CP 10 page 298) that Miss Kennedy "remains keen for trial of a vaginal delivery", leading her to believe she would have had a discussion with Miss Kennedy about VBAC, although also expecting that to have been discussed with Dr May. However there is no evidence of any discussion as to risks/benefits and options on the Ante-natal Assessment records, or in the correspondence to the GP. Miss Kennedy has no recall of such discussion (although I retain concerns as to what reliance I can place on Miss Kennedy's recall). Dr Dobbie assumed that either Dr May or Dr Michie discussed birth options with Miss Kennedy, and was sure he had discussed the risks of vaginal birth with her. He accepted that *he* did not specifically set out risk statistics nor specifically offer the choice of elective C-section. He did mention C-section in the context of sterilising Miss Kennedy in the event of a C-section being required. There is no written record of any discussion of risks and options between Dr Dobbie and Miss Kennedy.

The community midwife, Marion Dodd, was the named midwife, although she did not undertake all of the ante-natal meetings with Miss Kennedy. She was sure Dr Dobbie would have discussed risks and options with Miss Kennedy, and also certain that she would have

done so. However, she would normally note such discussion in the Pregnancy Record booklet, and had not done so.

In these circumstances it is unclear to me whether Miss Kennedy was counselled as to the risks/benefits of VBAC versus C-section, and whether she was offered the choice an elective C-section. It is very important that this should be done. It is the responsibility of midwifery and medical staff. Even in a situation such as this, where the ultimate decision was a matter for the Consultant in charge, and where that decision might not be capable of being taken until quite late in pregnancy, there is value in discussion and in the provision of information at all stages. Here, for example, midwife Dodd noted Miss Kennedy hoped to deliver in the Midwifery Unit. For a red pathway patient such as Miss Kennedy this option would not have been recommended at all. Proper discussion would provide the chance to explain this, to set out the risks, to assess whether the patient understood the risks, and thus to better arm her to make choices later. Recording such discussions provides clear information to those later dealing with the patient so that all midwifery and medical staff know what has been discussed (and as pertinently, what has not). It goes without saying that better recording puts all of the care providers in a far stronger position when they are being questioned about decisions and events months and years later.

Accordingly, I recommend that the Pregnancy Record booklet should be amended in the section headed "Birth Plan" so as to include a new section relating specifically to women considering VBAC, to include sub-sections headed –

[1] Risks relating to the pregnancy,

[2] Risks and benefits of VBAC versus C-section,

[3] Preference for mode of delivery.

All sections should be completed by the midwife. The applicable risks should be listed at 1. The risks and benefits should be noted with the content of the discussion at 2. A tick box with a choice of VBAC or C-section would suffice for 3.

Additionally, within the Ante-natal Assessment records, the obstetric team should clearly document that the following has been discussed with a woman considering VBAC –

[1] Risks relating to the pregnancy,

[2] Risks and benefits of VBAC versus C-section,

[3] The birth plan agreed between the Consultant and the woman.

Where possible this discussion should take place between the woman and the named Consultant, and the note recorded by that Consultant.

Birth Plan and use of Syntocinon

Birth plan

Miss Kennedy gave evidence that at an ante-natal appointment with Dr Dobbie on 10 December 2010 she was to go to the labour ward on 14 December 2010 and he would "give [her] a couple of hours, and if nothing happens we will take the baby out". She thought the plan was for a natural birth, initiated by ARM, with a wait to see if that worked, failing which a C-section. She appeared also to have an awareness that a drug would be used to "speed up" labour.

Dr Dobbie had hoped Miss Kennedy would go into spontaneous labour as that would give her the best chance of a successful vaginal birth, and that he gave her as long as he was comfortable with before arranging her admission to the ward on 14 December 2010 for induction of labour. On that day he performed ARM at 10.10 am and reviewed Miss Kennedy at 12.30 pm. At this time he instructed midwife Lynch to commence an infusion of Syntocinon and he recorded in the labour and progress sheet "Plan - short trial of Syntocinon for couple of hours and review."

Dr Riad understood there was a plan to attempt to achieve vaginal delivery and proceeded accordingly, adapting that overall plan to the subsequent developments.

Midwifery expert Ms McConville criticised actions after 2.47pm as being undertaken against a background of no Consultant plan, Dr Dobbie's plan having effectively come to an end with the instruction to review.

There is no suggestion that any lack of clarity in Dr Dobbie's note caused or contributed to Elijah's death. Dr Hughes' evidence makes that clear. There was no criticism of the steps taken by Dr Riad as a matter of clinical practice. There were no adverse indicators per the CTG, and no warning of impending uterine rupture. However, it must be the case that a clear record of the Consultant's plans for management of a high risk pregnancy should be made, and that scope for misunderstandings, or misinterpretation, should be reduced if not avoided. While there is no evidence that a clearer note would have avoided the death, a more specific note, (particularly recording Dr Dobbie's view that a C-section should follow) ***might*** have influenced the thought processes of staff subsequently dealing with Miss Kennedy, and might have removed, or diluted, the focus on establishing labour.

The Court heard evidence from Ms McConville that it would be of value for the Consultant's plan to be recorded on the Partogram, a document which lies openly visible in the labour room, and which is completed at 15 minute intervals by the midwife to record the baby's heart rate and other observations. Such a document is readily available to all care-givers in the room, and would ensure the information is easily accessed, notwithstanding any staff changes.

Syntocinon

As I have already commented, Syntocinon is a synthetic hormone used to start and augment labour. It must be prescribed by a doctor. For a high risk patient, such as Miss Kennedy, it must be prescribed by a Consultant.

In 2010 the Syntocinon regimen was contained within the protocol E1 document (CP 8, 124). This protocol was intended to provide guidance for midwifery staff in the rate of increase of, and intervals between, increments in the rate of infusion.

At that time there was no specific guidance as to infusion rates for the VBAC women. All of the midwives who gave evidence, however, knew to be cautious and all acted broadly within the same limits. Universally, the infusion was increased in increments of 3 mls (ie, 3, 6, 9 and 12), and no interval fell below 30 minutes.

It would be beneficial for there to be specific guidance for the VBAC woman. The Court heard evidence from Dr Jane Ramsay that following an internal review after Elijah's birth the Health Board have introduced 3 separate bundles on the use of Syntocinon, one being aimed specifically at high parity and VBAC women such as Miss Kennedy. The new

regimen (CP 12, appendix 9.0, page 11) is readily accessible via the intranet and copies have been laminated and attached to the drip stands used for the delivery of Syntocinon in the labour ward. Broadly the new regimen reflects infusion increments of 3 mls at no less than half hourly intervals.

The Crown expert, Dr Hughes, was asked to comment on the new regimen, and was satisfied with the infusion increments, and the 30 minute intervals. However, she noted that the regimen provided for an increase in Syntocinon to 48 mls per hour over a 7 ½ hour period. She was of the opinion that it would be advisable, as an additional precaution, for midwives to have their discretion to raise Syntocinon limited to a specified maximum infusion and for a specified maximum period of time, thereafter requiring Consultant authority to increase further, the Consultant being best placed to determine the maximum infusion rate and timescale.

Accordingly, I recommend that a section be created in the Partogram (an example of which is found at CP 10, page 235) for the specific recording of the birth plan agreed between the Consultant and the VBAC woman, and the Consultant's directions for the use of Syntocinon. The birth plan is likely to be a transfer of that contained in the Ante-natal Assessment records (per the foregoing section), and should be noted on the Partogram by the Consultant. If the named Consultant is not available, it should be done by the Consultant, whom failing the Registrar, on duty. It should be recorded in consultation with the woman to ensure it is accurate, and remains up to date. The section should include:

[1] The agreed birth plan,

[2] Where applicable, the maximum infusion of Syntocinon to be administered by the midwife, with any increase beyond that maximum requiring Consultant authorisation, and

[3] Where Syntocinon is being infused, the maximum number of hours of infusion with any increase beyond that requiring Consultant authorisation.

It is obvious that in response to developing circumstances, especially in high risk cases, plans may evolve or change in the course of labour. Provided that the aim remains the same, there should be no need to make minor adjustments to the written record of the birth plan. However, in circumstances where the plan changes substantially, and in consultation with the woman, the written note of the birth plan should be altered on the Partogram, ideally by the Consultant, failing which by the Registrar on duty on the direction of the Consultant.

CTG trace and use of stickers

There was much evidence through the inquiry as to the interpretation of the CTG trace. Although all medical and midwifery witnesses agreed it was not reasonable or productive to look at the trace bit by bit, in fact much of the Court's time was spent doing just that.

Crosshouse Hospital had at that time recently introduced the use of stickers to supplement the labour and birth record. The aim was to provide consistency of interpretation of the CTG trace. An example, which was the subject of particular discussion, was found at Crown production 10, page 244. The discussion focussed on the "non-reassuring" column. If the directions on the sticker are followed, the presence of one non-reassuring feature calls for the trace to be assessed as suspicious overall. The Inquiry heard evidence as to the appropriateness of labour ward co-ordinator, Laura Muir, effectively overriding the sticker by interpreting and recording the CTG as reassuring, notwithstanding that she had circled a non-reassuring feature, namely, early decelerations. Miss Muir was a very experienced midwife, and her evidence was that under NICE guidelines, early decelerations can exist without being suspicious, and that she had used her training, knowledge and experience, had considered all other factors, and had thus concluded, overall, that the trace was not suspicious. Her judgement was supported by Dr Sanders, who had particular expertise in the field and who found the sticker to be too simplistic. To be non-reassuring, decelerations are to occur with at least 50% of contractions. In her opinion the stickers did not fit with the guidelines for the interpretation of CTG traces, and while they may be of use for more junior midwives – encouraging early referral to a senior colleague, or medical staff – it would be better to train all midwives in the same thinking.

There is no suggestion that the judgement exercised by Laura Muir impacted on the outcome here, and it is clear to the Court that the interpretation of CTG traces is a sophisticated skill, but it does seem anomalous, and potentially confusing, to employ a

sticker which may conflict with national guidelines, and which can be overridden (albeit by a senior practitioner in this instance). It calls into question the value of the sticker system at the very least. The Court heard no evidence as to how this might be better addressed, and can therefore make no recommendation, but it is a matter which the Health Board may wish to consider.

Guidance Document/Management of birth after C-section

In 2010 the Health Board provided a guidance document for medical and midwifery staff entitled "Management of Birth after C-section" (CP8, p 101 to 109).

At part 6.2 of the document, under the heading "Progress in VBAC Labour", and at the foot of p108, the document stated "If there is no progress over a 4 hour period, but uterine activity is viewed as sub-optimal then cautious augmentation with Syntocinon infusion may be considered in some cases following discussion with the Consultant obstetrician".

In her evidence Dr Hughes criticised the terms "sub-optimal" and "cautious augmentation" as vague. Following review of the document and in particular with the addition of appendix 9 (ie, the specific Syntocinon bundle for high parity/VBAC woman) Dr Hughes' concerns as to the interpretation of "cautious augmentation" were removed, but she maintained her criticism of "sub-optimal". In her opinion, specific guidance as to what was

meant by the phrase should be set out and she suggested "for example, less than 3 contractions per 10 minutes".

Dr Ramsay was open to the idea of greater specification, but reminded the Court that inducing labour was a very different situation from managing women in labour, and that it is very difficult to set out provision for every clinical scenario. For that reason I am of the view that the Court should not become involved in drafting the wording of such documents. Accordingly, whilst I suggest a helpful adjustment to the paragraph under discussion, might be "sub-optimal (as defined by the responsible Consultant) …..", I go no further. The Health Board may wish to reflect on Dr Hughes' remarks.

Consultant staffing in the labour ward

As I have mentioned previously, the family criticised the fact that there were three Consultants involved in Miss Kennedy's care on 14 December 2012. I have rejected their call for a Section 6(1)(d) finding, but have already made observation on the obvious benefits on minimising the number of handovers that occur. I note that following Elijah's death the internal reviews undertaken by the Health Board included a review of the Consultant staffing arrangements. Dr Ramsay gave evidence of the substantial efforts made by the Hospital to ensure, so far as possible that a 12 hour shift was operated with a single Consultant. Between July and October 2010, 47% of 12 hour week day shifts were covered

by one Consultant. This rose to 66% between October and December 2012, and to 88% by the time of the Inquiry, an improvement described as very good by Dr Hughes. Dr Hughes also stated it would be very difficult to achieve 100% compliance, and one can readily imagine why, although I note it is the Health Board's laudable aim.

Whilst it was not an issue for the Inquiry, I also note that the Hospital has now divided its obstetric and gynaecology team into three cohorts so as to create an "obstetrics only" team, the members of which are not pulled to gynaecology or theatre duties as was the case in 2010. This factor, and others, persuades me that the Hospital has carried out a thorough and broad minded review of its practices following this tragic event, and that the obstetrics department in particular has striven to improve its provision of care.

I conclude by expressing my gratitude to all representatives for the courteous and co-operative manner which they adopted throughout the Inquiry.