

SHERIFFDOM OF GRAMPIAN HIGHLAND AND ISLANDS AT ABERDEEN

B604/12

DETERMINATION

by

SHERIFF PETER G. L. HAMMOND, Advocate

in Inquiry into the circumstances of the death of

MRS. LESLEY DUNCAN OR COWIE

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

APPEARANCES:

For the Crown: Ms. Johnston, Procurator Fiscal Depute, Aberdeen.

For Grampian NHS Trust: Duncan, Q.C.

For Dr. Peter Danielian: Ms. Donald, Solicitor Advocate, Edinburgh.

For the Family of the Deceased: McDonald, Solicitor Advocate, Aberdeen.

Aberdeen, 18th July 2014.

The Sheriff, having considered all the evidence adduced and the submissions made thereon, determines in terms of section 6 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 as follows:

Section 6 (1) (a)

1. Lesley Duncan or Cowie, born 2 September 1976, died in the Intensive Care Unit of Aberdeen Royal Infirmary, Foresterhill, Aberdeen at 14.40 hours on 3 October 2007, as a result of ischaemic brain injury following a hypovolaemic collapse at Aberdeen Maternity Hospital, Cornhill Road, Aberdeen on 23 September 2007.

Section 6 (1) (b)

2. The cause of her death was ischaemic brain injury as a result of cardio-respiratory arrest consequent to [1](a) abdominal haemorrhage of the liver and spleen (b) Focal Nodular Hyperplasia of the liver, and [2] Insulin Dependent Diabetes Mellitus.

Section 6 (1) (c)

3. There were no reasonable precautions whereby her death might have been avoided.

Section 6 (1) (d)

4. There were no defects in any system of working which contributed to her death.

Section 6 (1) (e)

5. Other facts which are relevant to the circumstances of her death are set out in the following Note.

Sheriff

NOTE:

Introduction

[1] Section 1(1)(b) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 provides that where it appears to the Lord Advocate to be expedient in the public interest that an inquiry should be held into the circumstances of a death, the Procurator Fiscal shall investigate and apply to the Sheriff for the holding of an inquiry under the Act into those circumstances.

[2] This inquiry was held following an application by the Procurator Fiscal for the District of Aberdeen in respect of the death of Mrs Lesley Duncan or Cowie. Mrs. Cowie was a 31year old lady who had a complex medical history

featuring insulin dependent diabetes mellitus, and masses on her liver which were assessed as Focal Nodular Hyperplasia (“FNH”). On 23 September 2007, three days after she gave birth to a baby girl by emergency caesarean section, she suffered a hypovolaemic collapse due to blood loss caused by massive internal bleeding from her liver and spleen. Despite attempts at resuscitation and surgical intervention, she had suffered unsurvivable, global, hypoxic/ischaemic brain injury and remained in a coma. Over the next ten days no brain stem activity was detected. She was declared dead at 14.40 hours on 3 October 2007 and life support systems were thereafter switched off in consultation with her family.

[3] The evidence in this inquiry was heard over ten days in May and December 2013. The parties produced written submissions, and a Hearing on submissions was held on 10 March 2014. The Procurator Fiscal called the following witnesses:

- a. Christopher Cowie, the husband of the deceased.
- b. Dr. Shirley Copland, Associate Specialist in Diabetes and Endocrine Medicine.
- c. Professor Norman Mowat, Gastro-Enterologist
- d. Dr. Paul Lochhead, Gastro-Enterologist
- e. Dr. Rashid Manzoor, GP. (Senior House Officer in GP training at Aberdeen Maternity Hospital in September 2007).
- f. Dr. Sam Philip, Consultant in Diabetes and Endocrinology. (Specialist Registrar, ARI, in 2007)
- g. Dr. Peter Danielian, Consultant Obstetrician, Aberdeen Maternity Hospital.
- h. Dr. Malcolm Smith, Consultant Gastro-Enterologist, ARI.
- i. Mrs Leeanne Smith, Midwife.

- j. Mrs Ann McIntosh, Midwife.
- k. Dr. Alan Thomson, Consultant Anaesthetist, Aberdeen Maternity Hospital and ARI.
- l. Dr. Dimitris Miligkos, Gynaecologist. (Specialty Year 2 Trainee in Obstetrics and Gynaecology at Aberdeen Maternity Hospital in 2007).
- m. Dr. Mark Hamilton, Consultant in Obstetrics and Gynaecology.
- n. Mr. Abdul Qadir, Consultant Surgeon.
- o. Dr. James Grieve, Senior Lecturer in Forensic Medicine.
- p. Professor Michael Greaves, Professor of Haematology, Aberdeen University.

Mr. McDonald, on behalf of the deceased's family, called the following witness:

- q. Dr. Mervyn Davies, Consultant Physician, Gastroenterologist and Hepatologist, St James' University Hospital, Leeds.

In addition, I was referred to a number of documentary productions including Mrs. Cowie's general medical records, diabetic clinic records, Maternity Records, post mortem and toxicology reports and expert medical reports.

Background Medical History

- [4] Lesley Cowie was diagnosed with insulin dependant diabetes (Type I diabetes mellitus) in 1983 at the age of 6 years. This is a lifelong condition.
- [5] In February 1998, she suffered recurrent nausea and vomiting and was also found to have mildly abnormal liver tests. She was reviewed in the Gastroenterology ("GE") Clinic in March 1998, at which time an ultra-sound scan of her abdomen was carried out. This scan showed 2 large masses within the liver; one almost replacing the left lobe of the liver, and the other occupying the posterior aspect of the right lobe.

- [6] A biopsy in April 1998 showed features of FNH, an uncommon but usually benign and incidental scar like abnormality of the liver. It was also noted from the biopsy that there were present inflammatory cells which were not typical of FNH. At this time Mrs Cowie was advised to stop taking the combined contraceptive pill as it was recognised that this can make some liver lumps increase in size.
- [7] Although it is not usually necessary for a patient to be seen regularly after a diagnosis of FNH has been made, Mrs Cowie continued to be monitored regularly by the GE team in Aberdeen up until her death in October 2007. Between 1998 and 2005, the masses on her liver were found to be reducing in size. In November 2005, an ultrasound scan showed that the lesion on the left lobe of her liver had shrunk to 3cm and that there was no sign of any nodule on the right lobe.
- [8] In January 2007 Mrs. Cowie attended her GP and received confirmation that she had become pregnant. She was referred to the Combined Obstetrics/Diabetic Clinic, and came under the care of Dr Peter Danielian, Consultant Obstetrician. Dr. Danielian first saw her at the joint clinic on 30 January 2007. The referral letter noted the background of liver hyperplasia since 1998. She was seen at the clinic on a monthly basis during her pregnancy. Her liver function tests were essentially found to be normal throughout the pregnancy.
- [9] On 18 May 2007, when she was 20 weeks pregnant, she underwent an ultrasound scan which showed that there appeared to be 3 lumps within the left lobe of her liver, occupying the majority of this lobe. These had, therefore, enlarged during the pregnancy. On that date, they were found to measure approximately 5 cm, 4 cm and 3.5 cm. Because the nodules had grown, the medical team in the GE Clinic thought that they might possibly be hepatic adenomas rather than FNH. Hepatic adenoma is a different type of benign tumour. The significance of this distinction is that, during and immediately after pregnancy, FNH lesions are at low risk of bleeding whereas lesions which are in fact hepatic adenomas represent a high risk of bleeding.

- [10] By letter dated 28 June 2007 from Dr Malcom Smith, Consultant Physician/Gastroenterologist, this finding was relayed to Mrs Cowie's GP (Dr Murphy), and to Dr Danielian. The letter advised that a diagnosis of hepatic adenoma would not alter management of her care during the pregnancy, but ultra-sound scans would be carried out throughout her pregnancy to monitor the size of the lesions. It was stated in the letter, that there was "a small chance they may bleed at some stage". However, the risk of bleeding was not entered in Mrs Cowie's maternity records.
- [11] Because of the rarity of the condition, and the indication that the lesions may be prone to bleeding, Dr Daniellian had a telephone conversation with Dr Fraser from the GE Department. He was reassured during that phone call that the diagnosis was still one of FNH, and as such, the lesions had a very low risk of bleeding.
- [12] Mrs Cowie's final abdominal ultra-sound scan was carried out on 10 September 2007, when she was 37 weeks pregnant. The medical notes state that, compared to previous scans, there was no change in the size or appearance of the 3 focal lesions in the left lobe of her liver. The lesions were found to measure 5.4 cm, 4.6 cm and 4.1 cm. It was noted that the right lobe of the liver appeared normal, and a repeat scan post-partum was recommended.
- [13] Mrs Cowie's liver lesions were being regularly checked, and the plan after delivery was to resume monitoring of her liver.

Admission to Aberdeen Maternity Hospital – 18 September 2007

- [14] Towards the later stages of her pregnancy, Mrs. Cowie developed high blood pressure and swelling in her legs, and it was suspected that she was suffering from pre-eclampsia. She was therefore admitted to the Westburn Ward at Aberdeen Maternity Hospital on 18 September 2007 for induction of labour.

19 September 2007

- [15] At 14.40 hours on 19 September 2007, Mrs Cowie was transferred to the Labour Ward. At 18.10, she was positioned for an epidural anaesthetic. The medical staff had difficulty in siting the needle for the epidural, but after a number of unsuccessful attempts, the needle was successfully inserted.

20 September 2007

- [16] Due to lack of progress with labour under epidural anaesthetic, she was admitted to theatre for an emergency caesarean section at 02.50 on 20 September 2007. As a result of the caesarean section procedure, a baby girl was delivered at 03.35, weighing 8lbs 1oz.
- [17] Following delivery of the baby, Mrs Cowie was transferred to the Ashgrove Ward.
- [18] Her observations post operation indicated that her blood pressure was within the normal range. However her temperature was high, and peaked at 38.2 degrees at 07.15. Her temperature was again checked at 08.00 and was found to be within the normal range at 36.8 degrees. She was reviewed by the Consultant anaesthetist, Dr Thomson, and a junior anaesthetist, Dr Joshi. At this time, Mrs Cowie was already on antibiotics which had been prescribed for her during the labour process.
- [19] She was again reviewed at 08.30, and her temperature and pulse rate were within the normal range. Her face, hands and legs showed signs of “puffiness”.
- [20] At a further review at 09.00 with Dr Danielian, her tests were found to be normal, except that the most recent blood analysis showed that the sodium level in her blood was low. It was noted that she was feeling well.
- [21] At about 14.30, her C-reactive Protein (CRP) level was found to be high. This was suspected to be as a result of infection, which is not uncommon after a caesarean section. Dr Danielian instructed that further bloods be taken at 06.00 the following morning, so that the results could be ready for the morning ward round.

- [22] At 15.30 on 20 September, Mrs Cowie was admitted to the Ashgrove Ward. This is the post-operative ward, which specialises in diabetic mothers.

21 September 2007

- [23] At around 04.15 the following morning (21 September 2007) Mrs Cowie complained of shooting pain across her abdomen. It was suspected that this was from the surgical wound itself. She was given assistance with moving and felt more comfortable after that. Any abdominal surgery can cause post-surgery pain, and this would not of itself immediately cause concern to the medical staff.
- [24] Dalteparin is a drug that thins the blood and helps to inhibit blood clotting. It may be prescribed at either a lower (prophylactic) dose of 5,000 units, to prevent blood clots forming; or it may be prescribed at a higher (therapeutic) dose of 15,000 units to prevent any blood clot extending further. Prophylactic doses of Dalteparin are used routinely to reduce the risk of embolism in patients undergoing surgery, and the increased risk of bleeding can be controlled acceptably on such doses. In particular, it is prescribed as a matter of practice for patients after caesarean section who are not at high risk of bleeding.
- [25] Mrs. Cowie was prescribed a prophylactic dose of 5,000 units of dalteparin, which was to be administered intravenously. Although giving dalteparin can exacerbate the risk of bleeding, that risk has to be balanced against other risks of not giving it, such as pulmonary embolism. Mrs. Cowie had several risk factors for pulmonary embolism; which included undergoing a caesarean section, and having had pre-eclampsia as well as raised blood pressure in the latter stages of her pregnancy. In the opinion of Professor Michael Greaves, Consultant Haematologist, administering the prophylactic dose of dalterparin to Mrs Cowie was appropriate and justified having regard to these risk factors.
- [26] Professor Greaves was also of the opinion, from Mrs Cowie's medical notes and drug charts, that by the time of her collapse (on 23 September), there would not have been any significant amount of Dalteparin in her system which would have exacerbated her liability to bleeding.

- [27] At 12.50 on 21 September Mrs Cowie complained of “tummy soreness”. However her observations were noted to be satisfactory. Her white blood cell count, which had been slightly high the previous day, was seen to be going down. This trend continued over 22 and 23 September. Her sodium level had also increased to a satisfactory level, having previously been slightly low.
- [28] At 17.10 hours, Mrs Cowie was reported as feeling unwell, and appeared pale and tired.
- [29] At 18.15 her observations were found to be within the normal range and were not a cause for concern. It was noted that she had improved.
- [30] At 22.00 her blood pressure had increased, which would raise a concern of possible post-partum pre-eclampsia.

22 September 2007

- [31] At around 04.00 on 22 September, Mrs Cowie’s observations were further checked, and she was found to have a high temperature of 39 degrees and a high pulse rate of 120. She also had high blood pressure. These could be possible indications of infection. She complained of feeling unwell, and of pains in her right shoulder and right side. Shoulder tip pain can indicate that something is irritating the diaphragm. This could be accounted for by a number of different causes, such as amniotic fluid, an infection, a sub-phrenic abscess or the presence of blood.
- [32] An ECG was performed, as there were concerns that there could be a possible blood clot in her lungs. This was one possible explanation for the high readings and lower than normal oxygen levels.
- [33] Some time before 04.40, Mrs. Cowie was seen by Dr Dimitros Miligkos. She was still suffering from pain on her right side, and chest pain which was worsening on deep inspiration. She was also suffering from shortness of breath. It was noted that there was decreased entry in to the right mid chest, which could be a sign of pulmonary embolism as well as a chest infection. There was nothing at this stage to indicate that she was bleeding. Although her

haemoglobin levels were low, they remained constant, and corresponded with the pre-operative readings.

- [34] At 05.20, Dr Miligkos made a note of his examination. Possible differential diagnoses which occurred to him were (a) an intra-abdominal collection of fluid, (b) pyelonephritis (an infection of the urinary system or kidney) or endometritis (an infection of the uterus), (c) chest infection or (d) pulmonary embolism.

- [35] Intra-abdominal bleeding from her liver was not included in the differential diagnosis. The doctors did not link the liver to her current pain. Later that day it was noted that she had experienced similar discomfort when she previously had a liver biopsy in 1998. However the tests that were carried out were displaying normal liver and kidney function, so there was nothing to suggest at that time that there were any problems with Mrs Cowie's liver.

- [36] Suspicions were developing that infection was the source of the pain. The plan decided upon by Dr Miligkos involved taking more bloods and blood cultures to check for an infection in the blood stream. A decision was also made to check the urine for possible infection, and obtain a low vaginal swab. Mrs Cowie was put on to a more broad-spectrum regime of intravenous antibiotics. She was further given antithrombotic stockings. She was prescribed therapeutic Dalteparin at a dose of 15,000. Her dose of Dalteparin had been increased, as it was thought that she could be suffering from a possible blood clot. A chest X-Ray and V/Q scan were also considered. Vital signs were to be monitored 2 hourly, and if her temperature did not settle, the plan was for an abdominal scan to be done.

- [37] Observations at 05.45 demonstrated a slight improvement. She was feeling less pain in her shoulder tip and was mobilising well.

- [38] By 08.30 her condition had improved again. Her temperature was down to 36.8 degrees, and her blood pressure and pulse were within the normal ranges. This suggested that she may have been suffering from an infection which had been brought under control and was improving. Her haemoglobin levels had

remained fairly stable, indicating that she was not suffering from any significant bleed.

- [39] At 11.30 she was examined by Dr Rashid Manzoor, SHO. The blood results showed a high CRP reading of 276, suggesting infection, inflammation or bleeding. However these results were in relation to bloods taken during the preceding night. This scenario supported the conclusion that Mrs Cowie had been suffering from an infection of some sort, but by the morning her condition was improving.
- [40] Dr. Manzoor thought that Mrs Cowie may have been suffering from a blood clot, an abscess in her right sub-phrenic area or a chest infection. The plan was for a chest x-ray, and V/Q scan to exclude the risk of pulmonary embolism. If her symptoms persisted, an ultrasound scan of the abdomen was suggested, to rule out fluid within the abdomen. He spoke to a registrar about Mrs Cowie's situation, but did not involve a consultant in the decision making process at that stage.
- [41] If it had been deemed appropriate by a consultant, a V/Q and CT scan could have been requested. However this did not happen. There was evidence that, as it was the weekend, it was more difficult to obtain a V/Q and CT scan, although it was not impossible.
- [42] A consultant was always available if matters arose that required advice or attention at that level.
- [43] A portable x-ray machine is in operation within Aberdeen Maternity Hospital and was available for use. However Mrs Cowie was not given an x-ray as it was felt that it was more likely that she was suffering from a pulmonary embolism. According to the evidence, this machine would not have produced the best results and would not necessarily show any fluid within the abdomen.
- [44] At 12.30 her observations remained stable.
- [45] At 13.00, her condition was reviewed by the Senior Specialist Registrar, Dr. Liddiard. She noted that Mrs Cowie was complaining of shoulder tip pain and

discomfort in her right side, and that there was a history of hepatic nodules. She also discovered that Mrs Cowie had experienced similar discomfort after her liver biopsy in 1998.

- [46] By 14.00 her temperature had elevated to 39.5 degrees.
- [47] At 17.30 her temperature was noted as 38.7 degrees, and she was still suffering from shoulder tip pain. This continued throughout the afternoon and into the evening.
- [48] According to the medical notes, the impression was that Mrs Cowie was suffering from a diaphragmatic irritation. There was no indication that she was actively bleeding. Dr Danielian's evidence was that because the haemoglobin level had not changed, but a constantly elevated temperature and shoulder pain were being reported, his suspicion would have favoured an infection rather than any active blood loss.
- [49] On further review at 21.45, her pulse was still seen to be high and she had pain in both of her shoulders.
- [50] When she was seen again by Dr. Miligkos at 22.30, she was continuing to complain of abdominal pain and and shoulder tip pain. He thought that she was suffering from an infection in her chest or abdomen, or that she was suffering from a pulmonary embolism.

23 September 2007

- [51] At 03.30 on 23 September 2007, Mrs Cowie was feeling more comfortable, and her temperature and pulse rate had improved.
- [52] When she was reviewed at 09.20, her temperature had further reduced. However she was still complaining of bilateral shoulder pain. This was discussed with the registrar at the time, who advised to hold off carrying out any scans at that time. Dr Danielian's evidence was that he considered Mrs Cowie should have been moved to the labour ward for more intensive monitoring. As a consultant was not informed, this was not done. However, the signs she presented were consistent with the diagnosis that had been made.

- [53] Although she had been prescribed a therapeutic dose of Dalteparin, which was to be administered intravenously during the lunch time nurse's round, this was never given. Mrs Cowie had been breastfeeding during the ward round, and matters were overtaken by subsequent events.
- [54] At 14.00 Mrs Cowie buzzed for assistance, and indicated that she felt as if she was going to be sick. She was assisted to sit on the edge of her bed, where she looked faint and passed out for approximately 30 seconds. The midwife, Leanne Smith, called for assistance from other staff who attended. By this time Mrs Cowie was sitting up on the edge of her bed and was talking. She complained about feeling unwell and was still feeling sick. At this time it was thought that she was hypoglycaemic.
- [55] Leanne Smith tried to obtain a blood sugar reading, but the machine initially gave an 'error' message. Another midwife then gave her Lucozade, as it was near to hand, to increase her blood sugar. Blood sugar readings were eventually obtained – which were found to be 11.5 and 11.8. The staff then realised that, as these readings were on the high side, she was not hypoglycaemic.
- [56] Dr. Liddiard was contacted and attended Mrs Cowie's room. She found her extremely pale and clammy, and she was complaining of chest pain and abdominal pain. Dr. Liddiard examined her abdomen. Although the area was tender, she had no obvious signs of intra-abdominal bleeding and her abdomen was not distended. Dr. Liddiard could not listen to her chest as she was too distressed and complaining that she could not breathe.
- [57] Dr. Liddiard requested an ECG machine and a blood gas syringe for her to differentiate between the diagnoses of pulmonary embolus and intra-abdominal bleeding. She tried to find a femoral pulse but failed. Mrs Cowie was still conscious at this time. The midwife Ann McIntosh remained with Mrs Cowie, and spoke with her constantly to try and keep her calm. She continued to have difficulty breathing, and on trying to sit her up she collapsed again. At this point she lost consciousness. This was at approximately 14.25.

- [58] An Anaesthetist, Dr. Joshi, arrived and assisted with the opening of Mrs Cowie's airway. She was ventilated using a bag and mask and cardiac massage commenced.
- [59] At approximately 14.35, Dr. Thomson (Consultant Anaesthetist) and Dr. Manzoor (GP Specialist Trainee) attended at the Ashgrove Ward in response to an urgent call, following Mrs Cowie suffering collapse and cardiac arrest. Around this time Dr. Hamilton, (Consultant in Obstetrics and Gynaecology), was contacted at home as he was the 'on-call' emergency cover for obstetrics and gynaecological clinical care.
- [60] Dr. Thomson took charge of the situation upon his arrival. He obtained a history from the staff present, and was advised it was thought that Mrs Cowie had a pulmonary embolus. In his opinion this was possible, but he recognised that hypovolaemic shock due to internal bleeding was also a possibility.
- [61] Dr. Hamilton arrived and was briefed. Dr. Thomson tried several times to achieve wide bore venous access but was initially unsuccessful. However this access was achieved in the neck a short time later. By this time it was established that the deceased had a background of liver cysts.
- [62] Dr Hamilton thought that the likely cause of her collapse was either a pulmonary embolism, bleeding from the uterus or liver, or an aneurysm associated with her splenic artery. While resuscitation efforts were ongoing, there appeared to be no signs of unusual abdominal distension. Had there been such signs, these would have been a clear indication pointing to intra-abdominal bleeding.
- [63] Dr Hamilton carried out an ultrasound scan of the abdomen to see if there was any fluid present. No fluid could be seen at this time, which reinforced his view that a pulmonary embolism was very much a possibility.
- [64] The intensive resuscitation continued, including cardiac massage and numerous doses of adrenalin as well as administration of intravenous fluids. For a period of approximately 35 minutes following Mrs Cowie's collapse, no signs of electrical cardiac activity were detected.

- [65] At about 15.15, Doctor Liddiard checked again for a femoral pulse and found it to be present. It was also noted that by this time that Mrs Cowie's abdomen was grossly distended. Dr. Manzoor carried out an abdominal centesis (aspiration of blood from the abdomen), and around 20-30 cc of fresh blood was aspirated.
- [66] Dr. Hamilton was called back to Mrs Cowie's room. He saw her abdomen was markedly distended, suggesting that there was massive bleeding within the abdomen.
- [67] At approximately 15.30, Mrs Cowie was transferred to Theatre within the Labour Ward and an immediate laparotomy (opening of the abdomen) was carried out. Dr. Hamilton commenced the laparotomy and found the abdomen to be full of blood. He checked the uterus and found it was intact. The source of the bleeding appeared to be the upper abdomen. Mr. Qadir, Consultant Surgeon, attended to take over the procedure. Mrs Cowie's heart continued to beat spontaneously. On exploration, with the assistance of other surgeons, it became clear that there was bleeding from a tear in the splenic capsule as well as bleeding from the left lobe of the liver.
- [68] The spleen was seen to be actively bleeding and a splenectomy (removal of the spleen) was therefore carried out. The surgeons then carried out packing and stitching around the apparent site of the liver bleed. Two large abdominal packs were placed behind the liver to apply pressure on the raw area. A radiological selective embolisation was carried out to the hepatic artery of the left lobe of her liver, in order to cut off the blood supply to that area. The procedure concluded at approximately 18.15.
- [69] At approximately 22.30, Mrs Cowie was transferred as an emergency from the operating theatre at the Maternity Hospital to the Intensive Therapy Unit. At this time she was under the care of Dr David Noble.
- [70] Immediately on admission to ITU, Mrs Cowie was intubated, ventilated and sedated. She was then cooled in an attempt to minimise the effects of the hypoxic brain injury.

Subsequent developments

- [71] On Tuesday, 25 September, Mrs. Cowie had the splenic pack removed. Having returned from theatre, all sedation was discontinued to allow Dr Smith to assess her neurological state. She showed no signs of brain activity and remained in a deep coma.
- [72] Over the course of the next 3 days she had 2 ECG examinations. Both ECG's confirmed a very severe brain injury. Despite intensive supportive therapy, it was apparent that her brain damage was irrecoverable.
- [73] On Wednesday, 3 October 2007, a brain stem activity test was carried out, which showed no mid-brain activity; in other words, brain death. She was accordingly pronounced dead at 14.40 the same day, and life support systems were switched off.

Post Mortem examination and findings

- [74] A Post Mortem examination was subsequently carried out by Dr James Grieve, Senior Lecturer in Forensic Medicine, and Dr Paul Brown, Consultant Pathologist, on 5 October 2007. A report of the Post Mortem examination is lodged as Crown Production 1.
- [75] The cause of death was given as: -
1. (a) Intra Abdominal Haemorrhage
 - (b) Focal Nodular Hyperplasia of Liver
 2. Insulin Dependent Diabetes Mellitus
- [76] Dr Grieve noted that death was due to a massive intra-abdominal haemorrhage from the liver and spleen. This led to cardio-respiratory arrest which in turn caused unsurvivable global, hypoxic/ischaemic brain injury. His interpretation of the findings was that the spleen played a significant role in the catastrophic haemorrhage. The spleen was examined by Dr Johnston in Aberdeen, who is a

specialist in lymphoreticular pathology. He noted that there were unusual features in the spleen, which was then sent away for further specialist examination.

- [77] The spleen was found to have inflammation and reactive change in the capsule. At least two areas of change were present. One of these would have occurred – it is estimated –at most a matter of hours before the removal of the spleen. The second would have occurred previously, during a possible timeframe which could run from days to months. This conclusion was drawn as reactive changes were present in the liver, demonstrating that the body was repairing itself. Also seen were acute changes, which take hours to develop within the body.

- [78] Dr Grieve’s opinion was that the damage to the spleen had been caused by the enlarged liver having formed adhesions through cysts onto the spleen during pregnancy, and then pulling apart after the baby was delivered. The diagnosis made was that of FNH and not hepatic adenoma. Dr Grieve’s evidence was that the outcome for Mrs Cowie was not predictable, even though the deceased’s history of FNH was known to the medical staff at the hospital.

- [79] Dr Carl Grey, who was instructed on behalf of Mrs Cowie’s next of kin, is a Consultant in Histopathology and Forensic Pathology, and a Consulting Forensic Pathologist. He also concluded that the liver abnormalities were characteristic of FNH and were not hepatic adenoma. Dr Grey’s theory was that the most probable cause of the splenic capsular tear was that it was due to the prolonged CPR which was carried out after Mrs Cowie collapsed.

- [80] Dr Grieve felt that the explanation given by Dr Grey did not take in to account the acute reactive changes in the spleen. In his view, CPR was not responsible for the acute damage to the spleen. He pointed out that Mrs Cowie displayed signs of acute blood loss just prior to her collapse. This tended to suggest that any significant bleed was already ongoing before CPR was commenced.

Where and when the death and any accident resulting in the death took place
[Section 6 (1) (a)]

- [81] There was essentially no disagreement between the parties represented at the Inquiry as to the time and place of death. My determination, according to the evidence, was therefore that Mrs Cowie, died in the Intensive Care Unit of Aberdeen Royal Infirmary, Foresterhill, Aberdeen at 14.40 hours on 3 October 2007, as a result of ischaemic brain injury following a hypovolaemic collapse at Aberdeen Maternity Hospital, Cornhill Road, Aberdeen on 23 September 2007.

The causes of death and any accident resulting in the death [Section 6 (1) (b)]

Crown Submissions

- [82] The Crown invited me to make formal findings in this regard, in line with the certified causes of death.

Family Submissions

- [83] On behalf of the family, Mr McDonald took me through the Mrs Cowie's complicated medical background, the history of her pregnancy and admission to hospital, and the timeline between then and her death. The accident which resulted in the death was the massive bleeding from her liver and spleen which took place on the afternoon of 23rd September 2007. That bleeding was due to abnormalities of the liver and spleen arising from FNH of her liver. That led to acute hypoxic brain injury.
- [84] While Dr Grieve, in his evidence, suggested that the spleen played the more significant part in this bleeding, there was clear evidence from Dr Hamilton and Mr Quadir, both of whom operated on Mrs. Cowie on 23rd September 2007, that there was significant bleeding from her liver to the extent that a radiological procedure required to be carried out on her liver to try and stem the flow of blood. Dr Davies expressed the opinion that the bleeding originated from the lesions in the liver, and that the bleeding to the spleen was caused by the CPR carried out by medical staff immediately following the collapse. He submitted that the opinion of Dr Davies should be preferred to that of Dr Grieve in this respect.

- [85] Mr McDonald submitted that this massive blood loss was caused by the lesions on her liver. Dr. Davies observed that the lesions on the liver were not typical of FNH, in that they had expanded on Mrs Cowie becoming pregnant. He thought that the pain, and raised pulse and respiration rates over the period of two to three days prior to her collapse on 23rd September 2007, were as a result of small bleeds from the lesions, referred to as “herald bleeds” taking place over that period.
- [86] Dr. Grieve placed great emphasis on the signs of inflammation to the spleen, which appeared to pre-date Mrs Cowie’s collapse. Dr Davies, however, explains that this inflammation could have been caused by the bleeding from the liver lesions, which he believes started soon after delivery and certainly by 21 September 2007.
- [87] Mr McDonald submitted that the opinion of Dr Davies should be preferred to that of Dr Grieve in this respect. Dr Davies has been a Consultant Hepatologist and lead clinician at St James University Hospital in Leeds for 17 years. He is the Clinical Director of a Super Regional Liver Unit which serves a population of around 7 million and which deals with a number of rare and complex liver cases. In any event, however the bleeding to the spleen was caused, the root cause of the bleeding which led to her death arose from her liver condition.

Dr. Danielian submissions

- [88] Ms. Donald, on behalf of Dr Danielian, invited me to prefer the evidence of Dr. Grieve as to the mechanism of the cause of the catastrophic bleed.

NHS Grampian submissions

- [89] On behalf of Grampian NHS Trust, Mr Duncan submitted that the massive and rapid intra-abdominal haemorrhage is most likely to have emanated from both the spleen and the liver. The rupture of the spleen is likely to have occurred shortly before 2pm on 23 September 2007. Although there is no evidence to pinpoint exactly when the catastrophic bleed from the liver commenced, there

is no reason to think that this too would have been anything other than just before 2 pm.

- [90] Unlike the liver, the spleen was removed by operation. The spleen was therefore preserved in the state it was at the time, without any subsequent pathology interfering with interpretation of its features. There was evidence of capsular ruptures on the surface of the spleen, which would have caused bleeding. There was also evidence of an inflammatory response to the splenic disruption. The significance of this finding is as regards the timescale that it imposes on the visible damage to the spleen, and to any explanation for the cause of the bleed.

- [91] CPR can be discounted as a cause of the splenic bleeding. Mrs Cowie's collapse must have been a result of, and obviously subsequent to, the massive bleeding. There was no logical reason to exclude the spleen as a source of that bleeding. Because of the time it would take for the inflammatory response to develop, it was apparent that her spleen began to bleed shortly before her collapse. According to Dr. Grieve it is "extremely unusual" for a spleen to be damaged by CPR in this way.

- [92] On the other hand, post-mortem analysis of the liver is of limited importance in understanding how the catastrophic bleed arose. That is because, following the operation, the liver had further pathology superimposed on it as a result *inter alia* of suturing and embolisation. Two aspects of the liver pathology are relevant to understanding what occurred. Firstly, the liver was large. Secondly, it was affected by FNH, causing a roughness of the surface. These features lend weight to the process of apposition and sudden separation of organs posited by Dr. Grieve.

- [93] Mr Duncan made two further observations about FNH and the liver. First, despite the position of Dr. Davies, it is beyond doubt that that FNH is the nodular pathology seen on Mrs. Cowie's liver. Secondly, even Dr. Davies accepted that FNH of itself presented no risk of bleeding whatsoever.

- [94] In a number of respects, however, the analysis of Dr. Davies can be seen to be unsound and unsupported by the other evidence in the case. Mr Duncan

submitted that the court should approach Dr. Davies's opinion evidence with some care. Dr. Davies thought that the lesions on the liver were adenomas and not FNH. His point was that in contrast to cases of FNH, where the risk of bleeding was "vanishingly rare", the lesions on Mrs. Cowie's liver were predisposed to bleeding. He described them as "bombs inside her liver, which were at risk of going off". Dr. Davies clearly considered the lesions to be adenomas. His opinion on that matter is in conflict with all of the pathology evidence in the case, and it would seem that he had not been made aware of all of that evidence, particularly the report of Dr. Grey. Ultimately Dr. Davies accepted he could not challenge evidence given by a pathologist.

- [95] In relation to the spleen, it was clear that Dr. Davies had not considered or appreciated the microbiological analysis underpinning Dr. Grieve's hypothesis. What he asserted to be almost impossible, is, on a true analysis of the evidence, cogently explained by Dr. Grieve. It is based on the analysis of two other pathologists with expertise in analysis of the spleen and is also supported by Dr. Brown.
- [96] Mr Duncan took issue with Dr. Davies' apparent view that a scan undertaken following Dr. Liddiard's examination at 1pm on 22 September 2007 "could have...stopped everything that followed". Dr. Davies described the bleeding at that stage as "herald bleeds" from the liver. It is not clear when he considered those bleeds would have been detectable by scanning and what chance there was of them being seen. In Mr Duncan's submission, it cannot be safely concluded that a scan undertaken at any point before Mrs. Cowie's collapse would have detected blood within the abdomen. Firstly, Dr. Davies' view proceeds on the incorrect basis that the liver lesions with at high risk of bleeding. Secondly, he assumes that the blood present within the abdomen would have been detected by the scan. However, there is no basis for this assumption. The "herald bleeds" would lead only to a small collection of blood; and certainly less than the amount required to cause a collapse of the kind which Mrs Cowie suffered. Furthermore, Dr. Davies' theory of "herald bleeds" does not fit in with Dr. Grieve's explanation of the timing of the rapid and catastrophic consequences of bleeding from the liver and spleen.

- [97] Some time after Mrs. Cowie's collapse, Dr. Hamilton undertook an ultrasound scan, which did not detect any significant amount of free fluid within the abdomen. Dr. Davies dismissed Dr. Hamilton's findings in this regard as wrong.
- [98] Dr. Hamilton considered whether there might have been previous bleeding within the capsule of the liver, which was then ruptured during CPR, but on this matter he deferred to the pathology experts. Mr. Qadir confirmed there had been a tear to the splenic capsule. He recalled more than the ooze of blood coming from the spleen described by Dr. Hamilton.
- [99] Mr Duncan reminded me that there is nothing in the records that contradicts the mechanism described by Dr. Grieve. In particular, there is nothing to indicate any catastrophic or detectable bleed from either organ prior to the timescale suggested by Dr. Grieve. The evidence is that the various symptoms recorded as having been demonstrated by Mrs. Cowie are explicable by causes other than bleeding. Dr. Danielian said that of the symptoms recorded by Dr. Miligkos at 0520 on 22 September, only the pulse rate might be indicative of active bleeding, but there were other signs contra-indicating bleeding. By 08.20 that day Mrs. Cowie appeared to be getting better. Dr. Danielian considered that the findings recorded by Dr. Manzoor later that day (11.30) continued to confirm that she was getting better. His findings refer to possible causes of Mrs. Cowie's symptoms other than bleeding. There is no basis, and it was not suggested, that he was wrong about those possible explanations. Dr. Danielian did not suggest that Dr. Liddiard's finding of no active bleeding at 13.00 that day was incorrect. He considered that the temperature spike an hour later was consistent with sepsis. The symptoms as at 22.30 that evening were, said Dr. Danielian, consistent with infection.

Discussion

- [100] There was a clear divergence of professional opinion between Dr. Grieve, on the one hand, and Dr. Davies on the other hand, as to the mechanism whereby the overwhelming fatal bleed occurred and the timing of events to explain what occurred. Dr. Davies' explanation that the bleeding originated from the

lesions on the liver was underpinned by the existence of lesions which he though were not typical of FNH because they had grown in size during pregnancy. He thought the bleeding to the spleen had been caused by vigorous CPR carried out after Mrs Cowie's collapse.

- [101] Dr Grieve's theory is that the growing mass of the FNH on the liver during pregnancy, with the altering spatial arrangements of organs and tissues within the abdomen, had irritated and allowed the liver to become attached to the capsule of the spleen. Thereafter, so Dr. Grieve's theory goes, the two organs had pulled apart after delivery, causing a rupture of the capsule of the spleen and a disruption of the FNH on the liver. He described this as the process whereby bleeding from both the liver and the spleen has resulted.
- [102] Dr. Grieve explained how injury gives rise to different types of physiological response, which can hold clues to the timing and sequence of events in this case. He described reactive changes and inflammatory changes. The former take longer to develop. He explained that inflammatory changes can be differentiated between those arising at the most acute stage (polymorphonuclear leucocytes or polymorphs) and those emerging a little later, but still prior to the reactive changes. The polymorphs are the first to appear at the site of trauma, although even they need time to develop as the chemicals are released. The minimum amount of time for there to be a visible accumulation of polymorphs was, Dr Grieve said, 2-3 hours; with that process developing over the next few hours thereafter. On the basis that removal of the spleen "stopped the clock", this meant that emergence of the inflammatory process must have predated removal of the spleen by "at least 2 to 3 hours". The presence of polymorphs indicated that something was happening to the spleen "within these few hours before the collapse". What was going on was a rupture of the capsule. Consistent with his view that the bleed would have been rapid, the rupture would have occurred, said Dr. Grieve, "just before two o'clock" and the collapse would have occurred very quickly after that. Dr. Grieve indicated that it was possible that "50 minutes or an hour or whatever...before the actual collapse things may have been happening...when

bleeding has commenced and is growing and getting bigger.” But his evidence is that the catastrophic bleed commenced in the minutes before the collapse.

[103] I found Dr. Grieve’s evidence on this point compelling. His explanation seems to me to account for the pathological findings and fit in with the timescale which would be involved. I preferred Dr. Grieve’s evidence to that of Dr. Davies. Dr Grieve carries out around 500 post mortem examinations per year, and many of the subjects concerned would have had artificial resuscitation and cardiac massage. I placed weight on his evidence that, “..you do get damage from external cardiac massage, but, particularly where it’s offered by people who have been trained to do it, it is actually extremely unusual for the spleen to be damaged by that..”

[104] I accepted Mr Duncan’s submissions that Dr. Davies’ evidence was undermined somewhat by his understanding that the lesions concerned were hepatic adenoma and at high risk of bleeding, whereas the evidence clearly showed, in my view, that these lesions were FNH and therefore at very low risk of bleeding. As Mr Duncan pointed out, Dr. Davies ultimately accepted that he had to defer to the opinion of the pathologists in that regard.

[105] For these reasons, I am satisfied on a balance of probabilities that the explanation offered by Dr Grieve should be accepted. In my view, it has not been established that the underlying cause of the catastrophic collapse was bleeding from the liver lesions alone. Nor is it appropriate to conclude that the splenic bleeding arose from supervening external causes.

The reasonable precautions, if any, whereby the death and any accident resulting in the death might have been avoided [Section 6 (1) (c)]

Crown submissions

[106] On behalf of the Crown, the Procurator Fiscal Depute suggested that it might have been a reasonable precaution for the senior registrar on duty on 22 and 23 September 2007 to have conferred with the duty Consultant about Mrs Cowie’s condition. However, she acknowledged that the conclusion of the pathologists, Dr. Grieve and Dr. Brown, was that the catastrophic bleed

emanated from the spleen, and that this occurred a very short time before Mrs Cowie collapsed. Even if a consultant had been alerted to the situation, this would not therefore have had any ultimate impact on the outcome resulting in Mrs Cowie's death.

[107] Bleeding from FNH is extremely uncommon. Dr Davies acknowledged that if a diagnosis of FNH is made in a patient under his treatment, the patient would not have been seen by him again as complications are so rare. Dr Danielian sought the advice of Dr Fraser, a consultant within the Gastroenterology department about the risks, and he was advised that the possibility of a bleed from the liver lesions was very low indeed.

[108] For these reasons, the Procurator Fiscal Depute did not ultimately invite me to make findings under section 6(1)(c) that there were any reasonable precautions whereby Mrs Cowie's death might have been avoided.

Family submissions

[109] On behalf of the family, Mr McDonald submitted that the root cause of death was the liver condition of FNH. The significance of and potential risks posed by this condition were not properly recognised by the medical staff at Aberdeen Maternity Hospital either during her pregnancy or in the period after delivery when she became very unwell.

[110] She was first seen at the Maternity Hospital by Dr Danielian on 30th January 2007. He properly noted that she suffered from liver hyperplasia and this was noted in the "Special Features" section of her obstetric case sheet.

[111] Dr Danielian recalled receiving a copy of Dr Smith's letter to the GP. That clearly indicated that the lesions might represent adenoma and that there was a small chance that the lesions might bleed at some stage. Following this letter, Dr Danielian had a telephone conversation with Dr Fraser, the hepatologist, and the message which Dr Danielian took from this conversation was that the liver condition was not anything for him to worry about.

- [112] When Mrs Cowie became very unwell on 22nd and 23rd September 2007, none of the medical staff who attended her placed much, if any, significance on her liver condition. Had there been a prominent note on her records regarding the risk of bleeding, it is likely that the possibility of bleeding from the liver lesions would have featured more strongly as a possible explanation for her symptoms.
- [113] According to Dr Davies, although the liver lesions had been diagnosed as FNH, they did not present as classical FNH. The increase in size of the lesions suggested that they might be hepatic adenoma. For this reason Mrs. Cowie should have been treated as a super high risk pregnancy and there should have been some sort of “red flag” system to make the medical staff aware that a catastrophe could occur. The safe approach was to treat the lesions as hepatic adenomas until proven otherwise. There should have been a clear management plan and clear documentation to address the high risk of bleeding.
- [114] At no time during the period of Mrs. Cowie’s stay in hospital, from the time of her admission on 18 September 2007 to her collapse on 23 September 2007, was there any contact, liaison or discussion between the medical staff at the maternity hospital and staff at the GE department at ARI. Mr McDonald suggested that there could have been some involvement of the medical staff from the GE Department in her care during that period.
- [115] By 14.00 on Saturday 22 September, Mrs. Cowie had become very unwell. It was recognised by Dr Danielian that, by this time, her care should have been escalated. Dr Davies would have expected her to have been seen by a Consultant on 21, 22 and 23 September. Had this been done, the problem which caused her death might have been diagnosed prior to the ultimately fatal bleed on 23 September. From 14.00 on 22 September 2007, Mrs. Cowie could have been reviewed by the duty consultant obstetrician. She could also have been moved to the labour ward or ARI for more intensive monitoring.
- [116] Mrs. Cowie’s bloods were taken at 08.00 on Saturday 22 September and were not taken again until her collapse the following day. Yet, by 14.00 on 22 September, she had become very unwell. If further blood tests had been

taken, they might have given an indication of the condition which ultimately caused her death. Mr McDonald suggested that further blood tests could have been taken between 08.00 on 22 September and 14.00 on 23 September.

[117] Both Dr Manzoor and Dr Miligkos identified the desirability of obtaining scans and x-rays. These were not done because it is difficult for the Maternity Hospital to provide some of these services at the weekend and on public holidays. However, as pointed out by Dr Danielian, intervention at Consultant level would have enabled a CT scan to be carried out. Dr Davies was of the opinion that probably on 21 September; but certainly on 22 September, a CT scan should have been carried out. Dr Davies was certain that a CT Scan would have led to an earlier diagnosis of bleeding from the lesions and would have provided an opportunity to intervene.

[118] From 14.00 on Saturday 22 September therefore, investigations could have been undertaken by means of x-ray, chest x-ray, V/Q scan, CT scan and abdominal ultrasound scan. Had a CT scan been carried out on 21 or 22 September, and had that scan shown bleeding from the lesions on the liver, medical intervention would have been possible, namely an angiogram, embolisation of an artery and a laparotomy to place packing around the areas of bleeding.

[119] In summary therefore, Mr McDonald's submission on behalf of the family was that the court should make a determination under 6(1)(c) that the following reasonable precautions could have been taken which might have avoided Mrs. Cowie's death:

- a. The consultant hepatologist, Dr Fraser, could have written to Dr Danielian explaining, in better detail, the nature and extent of any risk of bleeding from the liver lesions.
- b. There could have been a face to face meeting between Dr Danielian and Dr Fraser, to enable Dr Fraser to explain the nature and extent of any risk of bleeding from the liver lesions.

- c. There could have been a written note of any discussions between Dr Fraser and Dr Danielian in relation to the risk of bleeding from the liver lesions, which could then have been available to the medical staff when she became very unwell on 22 and 23 September 2007.
- d. There could have been a clear management plan and clear documentation based on the assumption that the liver lesions represented hepatic adenoma, and therefore highlighting and addressing the high risk of bleeding from the lesions to the liver.
- e. The obstetric case sheet could have been clearly “red flagged” to show that the liver lesions presented a risk of catastrophic bleeding around the time of delivery.
- f. There could have been some involvement of the medical staff from the Department of Gastroenterology in Mrs. Cowie’s care in hospital.
- g. From 14.00 on 22 September, she could have been reviewed by the duty consultant obstetrician.
- h. By 14.00 on 22 September, she could have been moved to the labour ward or ARI for more intensive monitoring.
- i. Further blood tests could have been taken between 08.00 on 22 September and 14.00 on 23 September.
- j. From 14.00 on Saturday 22 September, Lesley Cowie’s condition could have been investigated by means of x-ray, chest x-ray, V/Q scan, CT scan and abdominal ultrasound scan.

Dr. Danielian submissions

[120] Ms. Donald submitted that the court should make only formal findings in respect of the actions of Dr Danielian as an individual. There was no basis for

the court to hold that there were reasonable precautions which Dr. Danielian could have taken whereby the death might have been avoided.

[121] Dr Danielian has been a Consultant Obstetrician at Aberdeen Royal Infirmary since 1996, and has specialised in that field since 1983. He outlined his experience, qualifications and academic research background. He regularly acts as an expert witness in medical negligence actions, and is most often consulted by solicitors acting on behalf of pursuers. He could therefore be properly viewed as an expert in his field.

[122] He was the only Consultant Obstetrician called to give evidence, and Ms Donald invited me to accept his evidence as compelling. Although there was within the productions an expert report from another Consultant in Obstetrics and Gynaecology, Professor Kevin Dalton, he was not called to give evidence. His report is therefore not part of the evidence at the Inquiry, and falls to be disregarded entirely.

[123] Dr Danielian saw Mrs Cowie during her pregnancy in the combined Obstetric Diabetic clinic. This allows patients to be routinely seen by both specialities, in light of the specific dangers which diabetes can bring to pregnancy and the unborn child. This, he explained, was quite normal. Although there was no formal liaison between his department and the GE department, he was aware she was being reviewed by them.

[124] Dr Danielian was the on-call Consultant from 09.00 on 20 September until 09.00 on 21 September. He had seen Mrs Cowie at 09.00 on Thursday 20 September. He asked that she be monitored, which was something done throughout the day. He discussed Mrs Cowie with his juniors later that day (noted as being at 14.30), and was reassured that her temperature had come down. He noted the rise in haemoglobin, which suggested no active bleeding was present at that time.

[125] Dr. Danielian was then off duty, and had no further involvement with Mrs Cowie, until after she had been transferred to the Intensive Therapy Unit. He next saw her on Tuesday 25 September, having been on leave from 09.00 on Friday 21 September. He was taken through the records after the initial period

on labour ward, and after transfer to Ashgrove. All appeared to be moving in the right direction until the early hours of Saturday 22 September, when further medical input and review was required. Whilst Mrs Cowie seemed to have had some interventions to good effect, she remained unwell. She was seen by the Specialist Registrar on Saturday 22 September at 13.00. Dr Danielian accepted that, by that time, a Consultant ought to have been called to review her. This was not because the Consultant would necessarily have done anything differently, but because the seriousness of the situation merited that escalation. In other words, even if the problem was a pulmonary embolism, which was one of the differential diagnoses, that is itself a serious matter. In particular because of the high temperature, which was not improving at this stage, Mrs Cowie merited senior review. He thought that Mrs Cowie ought to have been taken back to the labour ward on the evening or night of Saturday 22 September at latest. His view was that the plan at 05.20 was reasonable.

- [126] In Ms. Donald's submission, Dr Danielian's actions were reasonable in all the circumstances, and there were no reasonable precautions which he personally could have taken whereby Mrs. Cowie's death might have been avoided.

NHS Grampian submissions

- [127] Considering the evidence in the light of s.6(1)(c), the evidence of Dr. Grieve was very important. Standing his evidence regarding timing and the rapidity of events leading to the fatal collapse, there was simply no room for the view that any of what Mr. MacDonald might characterise as "reasonable precautions" satisfy the causal threshold. The obvious example to consider is scanning. There was no persuasive evidence that there would have been anything to see on scanning. Dr. Hamilton was unable to find any free fluid when he undertook a scan post-collapse.

- [128] In relation to Mrs. Cowie's pre-delivery care, almost every aspect of this came under scrutiny. Possibly this was as a result of criticisms made in Professor Dalton's report, which was not spoken to in evidence. The single issue relating to her pre-delivery care is whether, to use the terminology of Dr. Davies, Mrs.

Cowie's liver pathology ought to have been raised as a "red flag" within her medical notes so that those on the obstetric side could have responded appropriately.

- [129] Dr. Davies's evidence was flawed in a number of respects. His evidence was based on misconceptions about the view reached by the GE clinicians and about what was communicated by those clinicians to Dr. Danielian.
- [130] In Mr. Duncan's submission, not only had Dr. Danielian clearly read around the subject as he said, he had evidently gleaned from his reading a more accurate understanding of the literature than Professor Dalton whose analysis, on at least one point, Dr. Danielian agreed to be "sweeping and inaccurate".
- [131] In relation to post-partum care, Dr. Davies' position appeared to turn on the absence of a "red flag" within Mrs. Cowie's notes. In the absence of any "red flag", he accepted that the manner in which her case ought to have been escalated is a matter on which clinicians could disagree.
- [132] Dr. Danielian accepted that, irrespective of the absence of any red flag, there came a point when Mrs. Cowie's case required to be escalated. Nevertheless, the point was that he could not say whether, had she been referred to him at that point, he would have necessarily proceeded to a scan. He considered that her symptoms were consistent with processes other than bleeding. Moreover, the notion that a CT or ultrasound scan over her last weekend might have led to detection, and containment or prevention, of the source of the fatal bleed is pure speculation. Mr. Duncan reminded me that there was no evidence which the court could accept which indicated when the liver began to bleed; and as regards the spleen the evidence established that, at the earliest, some sort of process commenced about an hour before Mrs. Cowie's collapse.
- [133] Although the extent of care available at weekends was an issue which was raised at the Inquiry, Dr. Danielian's clear evidence was that there would have been someone available over the weekend at an appropriate level of seniority, to whom the case could have been referred.

[134] There was thus simply no evidence upon which the court could find established the existence of reasonable precautions that might have been taken, either prior to delivery or in the post-partum period, which might have avoided Mrs. Cowie's death. She had received a high standard of care.

Discussion

[135] In considering whether it is open to the Sheriff to make any findings in terms of Section 6(1) (c), the test according to the wording of the section must be kept in mind. What is required is not a finding as to a reasonable precaution whereby the death *would* have been avoided, but whereby the death *might* have been avoided. Certainty that the accident or the death would have been avoided by the reasonable precaution is not what is required. Neither is it necessary to establish a *probability* that the death might have been avoided. However speculation is not enough. What is envisaged is a real or lively possibility that the death might have been avoided by the precaution, and that precaution must have been a reasonable one. The requirement for a causal link excludes making findings under this subsection about areas of criticism which are unrelated to the death in question.

[136] The first area where Mr McDonald sought findings under this subsection related to communications between Dr. Danielian and his GE colleagues in the ante-natal period. His argument was that the risk of bleeding posed by Mrs. Cowie's liver condition should have been of concern, and this was not adequately communicated. He suggested that it would have been better for Dr Fraser to have written direct to Dr Danielian, and for this to have been followed up with a face to face meeting so that Dr Danielian properly understood the risk of bleeding. According to Mr McDonald, there should also have been a written note of the advice given by Dr Fraser to Dr Danielian. The lack of these measures meant that a note of the risk of bleeding from the lesions on the liver was never entered in the maternity records. The appropriate place to note this would have been under the "Special Features" section on page 2 of the obstetric case sheet.

- [137] On the question of communication, and whether more ought to have been made in the ante-natal notes of the liver pathology, the starting point is the evidence of Dr. Danielian, which I have no hesitation in accepting. Dr. Danielian was aware of the diagnosis of FNH. This was an uncommon condition for him to deal with, but he did not dismiss the condition as presenting no risk. In fact he took steps to acquaint himself with what the issues were about FNH. He did some reading around the subject. He also contacted the GE department after receipt of the letter of 28 June 2007 addressed to Mrs Cowie's GP, to establish whether there was something to worry about. Whilst the letter to the GP did suggest the liver pathology might be adenoma and not FNH, Dr Danielian was reassured by what he was advised. He had consulted expert colleagues, and it seems to me that he had no reason to doubt their advice. He could not remember the conversation in detail, but would have asked if he had anything to be concerned about as a Consultant Obstetrician. He was clear that he had an understanding that there was not a worry in this case.
- [138] Dr. Davies was critical of Dr. Danielian for not taking the default position that there was a high risk of bleeding from the liver condition. However, I do not think it is fair to say that Dr. Danielian was dealing with a diagnosis of "probable hepatic adenomas". As I understand it, Dr. Davies was not aware, until Mr. Duncan put it to him, that Dr. Smith and his colleagues had still considered Mrs. Cowie to have FNH. Nor had Dr. Davies been aware of the discussion between Dr. Fraser and Dr. Danielian, and that Dr. Fraser indicated to Dr. Danielian that her liver condition was not something to worry about. In cross-examination he said accepted that the absence of a "red flag" was explicable, standing that discussion. Although he added that he did not consider that the decision was correct, he accepted that that was something on which clinicians might differ. However, the evidence has established that Mrs. Cowie did not have hepatic adenomas. Thus the assumption of the GE clinicians that she had FNH was correct. Dr. Davies accepted that a patient with FNH did not require a "red flag". In my opinion, there was no need for any additional warning about a risk of bleeding from hepatic adenomas, because that was not the nature of the lesions on her liver.

[139] For these reasons, I am not satisfied that there is an issue about defective communication which requires to be addressed. I accepted Dr. Danielian's evidence about what he did to acquaint himself with the risks posed by these lesions, including obtaining Dr. Fraser's advice. These doctors are very senior and experienced practitioners, and I formed that view that Dr Danielian was well able to take away from a telephone conversation the important points. It seems to me that Dr. Fraser did explain the nature of the risk as he saw it, and Dr. Danielian understood what he was being told. It is not specified exactly what more Dr Fraser ought to have passed on. It is always possible to say that making a written record of a conversation assists the understanding of others about what was discussed. However, the outcome of that conversation was the advice that the lesions were not a high bleed risk, so it seems that any written note would not have highlighted an increased risk of bleeding to the medical staff dealing with Mrs Cowie in hospital in the lead up to her collapse. That being the case, I do not see what different outcome could have been obtained had any of these things been done. In any event, having regard to the mechanism of the fatal bleed which I have found established, the causal test has not been met. I am unable to say that there is a real or lively possibility that the death might have been avoided if any of these steps desiderated by Mr McDonald had been taken.

[140] Mr McDonald also proposes findings under this subsection that there could have been a clear management plan based on the assumption that the liver lesion represented a risk of catastrophic bleeding, and that this risk could have been "red flagged" in the obstetric case sheet. Again, in light of the evidence which I have accepted about causation of the bleeding, I am unable to make the finding suggested.

[141] I am also asked to consider making a finding under this subsection that "there could have been some involvement" of the medical staff from the GE Department in Mrs Cowie's care in hospital. It is not suggested what that involvement might have been, and how it might have led to a different outcome. This proposed finding seems to me to be both unspecific and inviting speculation. I do not accept, on the evidence, that this could be said to

be reasonable precaution whereby the death might have been avoided, within the scope intended by section 6(1)(c).

- [142] The same observation applies to Mr. McDonald's suggestion of possible findings relating to consultant review, blood testing and scanning, and the question of moving Mrs. Cowie to the labour ward or ARI for more intensive monitoring. However, these are matters which do call for comment, and my comments are to be found in the discussion under section 6 (1)(e) below.

The defects, if any, in any system of working which contributed to the death or any accident resulting in death [Section 6 (1) (d)]

- [143] As counsel rightly observed, the test for the purposes of s.6(1)(d) is a higher one than for s.6(1)(c). While the latter allows a finding on the basis of a reasonable precaution whereby the death "might" have been avoided, for section 6(1)(d) it must be proved on a balance of probabilities that the defect in a system of working actually contributed to the death. The fact that mistakes are made, or procedures are not followed, does not of itself equate to there being a defective system.
- [144] No submissions were made on behalf the Crown, the NHS or Dr. Danielian that there were defects in any system of working which contributed to the death of Mrs Cowie.
- [145] Mr. McDonald's position was that, in two respects, the matters he had already raised in the context of section 6(1)(c) could properly also be the subject of a determination under section 6(1)(d). In other words, they could also be considered defects in systems of working which contributed to the death of Mrs. Cowie.
- [146] His first point was that the system of working at ARI and Aberdeen Maternity Hospital was defective in that (a) it did not provide an adequate means of communicating important information about patients who were under the care of both the GE Department of ARI and the pre-natal clinic at Aberdeen Maternity Hospital and (b) there was no established procedure or protocol to

ensure that medical staff at Aberdeen Maternity Hospital liaised with medical staff at the GE Department about patients being seen by both.

[147] Secondly, in Mr McDonald's submission, there were difficulties in obtaining x-rays and scans for patients at Aberdeen Maternity Hospital and ARI. The lack of full access to scans and x-rays at Aberdeen Maternity Hospital and ARI at weekends and on public holidays amounted to a defect in a system of working.

[148] I have already commented on these issues in relation to section 6(1)(c). I did not find that communication issues were causally linked to the death. I did not find it established that access to scans or x rays out of hours had a bearing on the death. In any event, I accepted Dr. Danielian's evidence that that these could have been obtained out of hours and at weekends if the need arose. He confirmed that an ultrasound scan of the abdomen could be carried out by the obstetrics team at any time. X rays could be done by a radiographer at the main hospital. In the event of an emergency there was a portable x ray machine kept in the labour ward, although the picture quality was not as good as could be obtained at the main hospital. To have obtained a CT scan out of hours would have required the approval of a consultant, but an on-call consultant was available at all times if junior staff considered this was something which was needed.

[149] For the reasons given above, I am therefore unable to make a determination that these matter raised amounted to defects, that they raised issues involving any system of working or indeed that any of them could be said on a balance of probabilities to have contributed to the death.

Any other facts which are relevant to the circumstances of the death [Section 6(1)(e)]

[150] Although causation has a role in determining what findings can be made under section 6 (1)(c) or (d), section 6(1)(e) permits consideration of any other facts which are "relevant to the circumstances of the death", even though a causal link to the death has not been established. It has been suggested that this means the circumstances of the death as they may affect the public interest.

- [151] In the course of the Inquiry, Mr McDonald highlighted three matters which arose in the evidence but which I have decided are not engaged by the other subsections. Nevertheless, I agree with Mr McDonald to the extent that these matters call for comment, and in my view it is expedient to do so here in terms of section 6(1)(e). These seemed to me to be errors of judgement, and were frankly acknowledged to be so by Dr. Danielian, who agreed that they were unacceptable.
- [152] Firstly, irrespective of the absence of a “red flag”, it is clear that by 14.00 on 22 September, Mrs Cowie’s care should have been escalated. By that time, her temperature had deteriorated and she was unwell. She should have been referred to a more senior clinician at that time – a consultant or senior registrar – for review. However, the junior staff did not alert the consultant to the unfolding situation with this patient who had a complex medical history. The seriousness of the situation clearly merited input at a more senior level. It is always a judgement call for the individual doctor concerned when to seek advice from a senior colleague. However, in my view it would be sound practice for consultants to satisfy themselves that junior doctors under their leadership are aware of the appropriate levels of responsibility and can be relied on to seek advice appropriately or refer cases for consultant review when needed.
- [153] In this context, it should be noted that obstetric hospital procedures have moved on since 2007. In particular, an “*obstetrics early warning score*” system has been introduced to aid monitoring of patients who are unwell ante-natally or post-natally. This early warning score is a chart which records a variety of medical parameters, including blood pressure, respiratory rate, heart rate and temperature. A score is then assigned according to the level of the recorded readings. Depending on the score, there are instructions for midwifery staff and junior medical staff to escalate review of the clinical situation. This commendable innovation was introduced in 2008, and in my view it will go a long way towards addressing this concerning issue which was identified in the evidence.

- [154] Likewise, Dr. Danielian thought that the actions of the junior staff fell short of his expectations in that the escalation in Mrs Cowie's care should have included her relocation to the labour ward for more intensive monitoring.
- [155] Finally, there was an inexplicably long gap between taking bloods. Mrs Cowie had blood taken for testing at 08.00 on 22 September. She became unwell by 14.00 that day. Dr. Miligkos planned to take bloods the following morning. Despite that, further blood tests were not carried out until after her collapse. Dr. Danielian regard that as unsatisfactory

Concluding Remarks

- [156] In making a determination under section 6 of the 1976 Act, it is not the function of an Inquiry to make any findings of fault or to apportion blame. Questions of what might or might not have been reasonably foreseeable are for consideration elsewhere and are not appropriate to this forum. The legislation is intended to permit retrospective consideration of matters with the benefit of hindsight where appropriate. However, the scope of my findings is limited by the statutory framework.
- [157] I appreciate the assistance of the Procurator Fiscal Depute, and counsel and agents, for taking the very complex technical and expert evidence in such a focussed way, and for their clear, careful and helpful submissions.
- [158] It only remains for me to join with those who have expressed their condolences to the family for their sad loss.

Sheriff