QUEENSLAND COURTS

OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Nardia Annette CVITIC**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Brisbane
FILE NO(s):	COR/02 2727
DELIVERED ON:	29 October 2007
DELIVERED AT:	Brisbane
HEARING DATE(s):	14 December 2005, 7,8,9,10,13,14, 15,16,20,21, 22,23,24, 28 March & 5 September 2006
FINDINGS OF:	Ms Christine Clements, Deputy State Coroner
CATCHWORDS:	CORONERS: Inquest – Elective surgery to treat cancer of the cervix by radical hysterectomy; Cause of sudden collapse post surgery; Treatment for post operative complications; Query bleeding or pulmonary embolus; Administration of Heparin.

REPRESENTATION:

Mr R A Perry SC appeared to assist the coroner

Ms J H Dalton SC (instructed by Minter Ellison Lawyers) for the Mater Hospital

Mr P Freeburn SC (instructed by Tress Cox Lawyers) for the State of Queensland including the Royal Brisbane Hospital, Royal Women's Hospital and the Department of Health

Mr G W Diehm (instructed by Black Dawson Waldron Lawyers) for Dr Alex Crandon

Mr A Luchich (instructed by Flower and Hart Lawyers) for Dr Christopher Andrews

Mr D H Tait SC (instructed by United Medical Protection) for Dr Bruce Ward

Mr M O'Sullivan (instructed by Cooper Grace Ward Lawyers) for Dr Mark Caporn.

CORONERS FINDINGS AND DECISION

Coroners Act 1958 **applies**

1. The inquest was conducted pursuant to section 26 of the *Coroners Act 1958* ("the Act") because Ms Cvitic's death occurred before 1 December 2003, the date on which the *Coroners Act 2003* was proclaimed. It is therefore a "pre-commencement death" within the terms of section 100 of the latter Act, and the provisions of the *Coroners Act 1958* are preserved and continue to apply in relation to the inquest. I must deliver my findings pursuant to the provisions of that Act. I do so, reserving the right to revise these reasons should the need or the necessity arise.

2. The purpose of this inquest, as of any inquest under the Act, is to establish, as far as practicable –

   - the fact that a person has died:
   - the identity of the deceased person;
   - whether any person should be charged with any of those offences referred to in section 24 of the Act;
   - where, when and in what circumstances the deceased came by their death.

3. A coroner's inquest is an investigation by inquisition in which no one has a right to be heard. It is not inclusive of adversary litigation. Nevertheless, the rules of natural justice and procedural fairness are applicable. Application of these rules will depend on the particular circumstances of the case in question.

4. In making my findings I am not permitted, under the Act, to express any opinion on any matter which is outside the scope of this inquest, except in the form of a rider or recommendation.

5. The findings I make here are not to be framed in any way which may determine or influence any question or issue of liability in any other place or which might suggest that any person should be found guilty or otherwise in any other proceedings.

Introduction

6. Nardia Annette Cvitic ("Ms Cvitic") was born in Sydney on 13 March 1971. She died at the Mater Hospital ("Mater") at Brisbane on 21 February 2002 at the age of thirty. She was the mother of two children, who were aged twelve and five at the time.

7. Ms Cvitic had undergone a total abdominal hysterectomy due to cervical carcinoma. This operation occurred on 11 February 2002.

8. A registrar, Dr Meyrick who initially reported her death to the coroner said "*an event*" occurred on the ward on 14 February. Her haemoglobin had

dropped and she had collapsed. She was returned to theatre that day and subsequently died on 21 February 2002.

9. Dr Peter Cook, from the ICU, also telephoned the coroner's office. He was reluctant to issue a cause of death certificate. There was uncertainty about the cause of death. He was advised to formally report the death to the coroner via the police.

10. The form 4 report of death stated:

> "*On 21 February 2002 police attended the Mater Hospital re deceased person Nardia Cvitic date of birth 13 March 1971. The deceased was admitted to the Mater Hospital on 11 February 2002. The plan was for a radical hysterectomy lymph node resection, omentum transposition and appendectomy and bilateral salpingo oophorectomy. The deceased had several blood transfusions. Due to having several blood transfusions the deceased had multiple organ failure and due to this received brain swelling. The deceased died at the intensive care unit at approximately 13.20 on 21 February 2002. A life extinct form was completed by Dr Meyrick. Police spoke to registered nurse Jane Hancock who completed a statement of identification of the deceased after being identified as the deceased by Winifred Cvitic, mother*."[1]

Autopsy report

11. On 22 February 2002 an autopsy was performed by Dr Nathan Milne ("the pathologist") of the John Tonge Centre.

12. The pathologist recorded that Ms Cvitic's height was 164cm and her weight was 72 kgs. I note this weight contrasts with entries in the medical record. Ms Cvitic's pre-operative weight was recorded as 56kgs and she was described as thin. Other witnesses referred to her weight as 52kgs. I accept that her weight at the time of the initial operation was between 52 and 56 kgs.

13. The pathologist recorded the presence of various tubes, vascular and arterial lines, catheters and 1 intra-axillary drain in the left arm. He made no reference to the exit site for the right abdominal drain which had been removed or displaced on 14 February 2002.

14. After listing his observations the pathologist commented:

> *"Ms Cvitic was a 30 year old woman who underwent a radical hysterectomy for cervical adenocarcinoma. This was complicated by continued bleeding which required extensive and multiple transfusions. She developed cardiac, respiratory,*

[1] Exhibit A2

renal and hepatic complications. Generalised cerebral oedema was noted on CT scanning.

Post mortem examination showed changes consistent with ischaemic brain injury, bronchopneumonia, hepatic injury and renal injury.

Histopathological examination showed cerebral ischaemia, bronchopneumonia, hepatic necrosis and haemorrhagic foci in several organs.

She died of multiple organ failure resulting from multiple transfusions required for post-operative haemorrhage resulting from a bleeding disorder. The nature of the bleeding disorder was not able to be determined. There were contributing factors of cervical adenocarcinoma and coronary atherosclerosis."[2]

15. The pathologist listed the cause of death as:

    1(a) Multiorgan failure.
    1(b) Multiple transfusions for post operative bleeding.
    1(c) Bleeding disorder.
    2 Adenocarcinoma of cervix. Coronary atherosclerosis.

16. As the autopsy report did not go into any further detail or interpretation of the observations in the context of the medical record of treatment, the pathologist was not called to give evidence.

Summary of events

Pre operation

17. Ms Cvitic was referred from the Queen Elizabeth II Hospital. She had been diagnosed with adenocarcinoma of the cervix. She had a history of heavy menstrual bleeding. On preliminary cystoscopy examinations in January 2002 she had suffered the complication of heavy vaginal bleeding requiring two litres of packed cell transfusions.[3] After transfusion her haemoglobin was 102g/L. She was assessed as having no other relevant medical history and a radical hysterectomy lymph node resection, omentum transposition and appendectomy with bilateral salpingo oophorectomy (removal of fallopian tubes and ovaries) was planned for 11 February 2002 with Doctor Bruce Ward to undertake the surgery.

18. There has been no issue raised concerning the necessity to perform the surgery of 11 February 2002.

[2] Exhibit A7
[3] Medical records, report of Dr Heng Tang

19. On 8 February 2002 test results for Ms Cvitic record her haemoglobin at 113L g /L.[4] The normal range was said to be 115-165 g/L.

Initial operation on 11 February 2002

20. Professor Bruce Ward ("Dr Ward") is a medical practitioner in the speciality of gynaecological oncology.[5]

21. Dr Ward provided a statement which includes the following reference to the initial operation:

> "*The operation was routine and involved minimal blood loss and there were good clearance margins around the tumour."* [6]

22. The next day he reviewed her and there were no specific problems. He did not see her on the second day post operatively but the medical notes indicated a satisfactory condition.

23. In evidence he agreed he had used two Blake's drains at the end of the procedure. He had used drains in as many as 550 operations in the previous 3 and a half years.[7] He stated the right drain exited in the lower abdomen.[8]

24. Dr Sophia Elmes, was a second year registrar in obstetrics and gynaecology in her second week of working with Dr Ward at the Mater. She assisted at the operation performed on 11 February 2002.

25. In her first statement, made on 14 November 2002, she says there was nothing out of the ordinary in the operation.[9] She estimated that Ms Cvitic lost between 600mls to 1 litre of blood during this procedure, which she considered to be an average amount. Her description of the placement of the drains was:

> "*Two Blake Drains were inserted in the retroperotoneal. As the procedure was an open operation, the drains are placed internally and pushed out through the abdomen wall with a sharp needle. The procedure is done either visually or by feel by the surgeon. The drains are inserted to remove any blood or ooze of lymph fluid as a result of the procedure. It would not be uncommon for about 500mls of fluid to be drained over the couple of days following the operation.*

[4] Exhibit C1
[5] Exhibit A16 (Dr Ward's CV)
[6] Exhibit A 16
[7] Transcript Page 949, lines 6-10
[8] Page 868, 869, lines 50-59
[9] Exhibit E 40

The potential risk of a Blake drain being inserted is the perforation of blood vessels or the bowel. It would however be easier to perforate a blood vessel in the abdomen wall than the iliac veins.

The two Blake drains were inserted by Dr Ward and I didn't recall there being any immediate bleeding subsequent to the drains being put into place. It is possible a blood vessel was perforated during the insertion of the drains and the pressure of the drains on the vessel may have restricted the initial bleeding, only to open when the drains were eventually removed. This however is unlikely."[10]

26. In oral evidence Dr Elmes thought it unlikely that a vessel had been perforated by a drain as she thought it unlikely that the drain would sit there for three days and then, when removed, the vessel would bleed.

27. In Dr Elmes' second statement, provided in March 2006, she repeated her recollection that there was not a significant amount of intra-operative bleeding:

"*If there had been, I would have written in the post operative orders 'Hb next day.' If I was concerned about intra operative blood loss I would have carried out the blood tests the next day, rather than waiting for the second post operative day, as recommended by the guidelines."*[11]

28. Dr Elmes' oral evidence was that she had no particular memory of who placed the drains or where they were placed.[12]

Post-operative testing

29. Dr Elmes gave evidence at the inquest that she had been told by Dr Ward not to order blood tests unless directed by him. This direction occurred at the end of her first week at the Mater. She understood this to be an instruction that superseded any advice in a guideline.

30. This was supported by the statement of Dr Fonseka, a junior house officer who was also in her second week on Dr Ward's team. She said:

"During the first week I was often in theatre assisting the surgical team with minor aspects of the operations. During that first week, I was filling in pathology request forms for each patient to be done the next day as each patient left the operating theatre. During the second week, however, I was instructed by Dr Sophia Elmes not to order any more blood tests for the next day. This was the time during which Nardia

[10] Exhibit E 40, paragraphs 10- 12
[11] Exhibit C319, paragraph 12
[12] Page 192, line 30-31, and page 226, line 28-30

Cvitic's operation occurred. At the time I did not query with Dr Elmes why we were no longer taking blood samples from patients after their operations. Later on I enquired with Dr Elmes as to the reason behind not ordering blood tests anymore. She simply said that it had come from a higher level, namely Dr Ward."[13]

31. Evidence was tendered to the inquest which demonstrated that in the second week that Dr Elmes was at the Mater the number of tests she ordered decreased markedly to only three. This she said was the result of Dr Ward's direction at the end of the first week. Subsequently after the events regarding Ms Cvitic, Dr Elmes resumed ordering post operative testing in her third week and final week of placement.

32. I have considered Dr Ward's evidence about his recollection of this matter but I accept the evidence of Dr Elmes and Dr Fonseka on this issue.[14]

Events of 14 February 2002

33. Dr Elmes' evidence was that on 14 February she saw Ms Cvitic in the morning and was called back to her when she complained of feeling unwell and fainted. The right side drain had become partly dislodged and Dr Elmes removed it while Ms Cvitic was on the bed and conscious. Ms Cvitic told Dr Elmes it was hurting and she wanted both drains removed. Dr Elmes did not make any observations of anything unusual at this time. When she removed the drain she recalled a significant amount of blood on the sheets.[15]

34. Significantly Dr Elmes recalled that in the half hour period after the drains were removed leading up to her collapse, her abdomen became more distended. Dr Elmes considered this must be due to bleeding and she noticed bruising around the drain sites. Ms Cvitic was losing blood pressure and becoming tachycardic despite having an intravenous (IV) drip in place. Ms Cvitic's condition continued to decline and Dr Elmes instructed that Dr Ward should be notified.

35. Dr Elmes noted bluish discoloration around the original surgical incision. She said :

"*The conclusion I drew was that she had intra-abdominal bleeding*." [16]

36. Dr Elmes ordered "O" Negative blood because cross matched blood would not be available in time to improve the patient's condition. Ms Cvitic's lowered haemoglobin result became available and a transfusion was commenced.

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[13] Exhibit B48, paragraph 7-8
[14] See paragraph 148
[15] Page 202, line 40-50
[16] Page 201, line 32-33

37. Dr Ward attended, made his own assessment and decided to return her to theatre. Dr Elmes told the Court that it was her belief that this was because a surgical complication of bleeding was the most likely cause of the collapse. Had it been considered that there was a pulmonary embolus or a cardiac problem then Ms Cvitic would have been sent to intensive care rather than theatre. Dr Elmes also noted that initial treatment for pulmonary embolus would be with medication, not surgery.

38. Dr Elmes recalled Dr Ward expressing to her his view as they went to theatre that it was not likely to be bleeding because she had been well up to that day. This was contrary to Dr Elmes' assessment but she was shocked by the patient's rapid decline and did not express this view to Dr Ward because of her relative inexperience.

14 February 2002 : The first operation

39. Dr Ward's statement reads:

> "*When I saw Ms Cvitic, she had signs of peripheral shutdown, was hypotensive, and her haemoglobin level was 5.4 grams. My initial view was that the patient had had an intraabdominal bleed, and I arranged for her to be transferred to theatre, where an emergency laparotomy was carried out."*[17]

40. On opening the abdomen, Dr Ward's statement continued:

> "*At that time, about one to one and a half litres of old blood was found in the abdomen. I felt that this was not sufficient to explain the patient's collapse. I arranged for a haemoglobin estimate to be carried out on a sample of the blood from the abdomen, which subsequently came back with a reading of 17 per hundred mils, which indicated to me that it was indeed, old blood, and that there had not been a significant fresh bleed immediately prior to the laparotomy. I carefully examined the abdomen, but was not able to identify any active bleeding site. The patient's cardiac output was poor, despite resuscitation."*[18]

41. This first operation on 14 February 2002 commenced at 11.00am and continued until about 11.55am. Haemoglobin results were taken at various times as noted [19] below.

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[17] Exhibit A16

[18] Exhibit A16

[19] Haemoglobin results from arterial blood taken on 14 February were as follows:

11.10am	12.44pm	13.40pm	14.15pm	14.50pm
Total Hb				
81L	76L	55L	95L	110L

42. Dr Elmes recalled the theatre being very busy with various doctors attending throughout the procedures. Dr Ward was assisted by Dr Stephen Allison, with the anaesthetists Drs O'Shea and Andrews present. Dr Caporn was also present.

43. Dr Elmes had a limited view of the patient. She confirmed she saw the midline incision and some blood in the pelvis, estimated by her to be between 500 and 1500mls. [20] She could not be confident she was in a position to see whether there was active bleeding. The source of bleeding could not be found.

44. The evidence was that a midline, vertical incision was made at this first laparotomy. The original transverse surgical incision was not opened, meaning that access to the lower abdomen was restricted.

45. Dr Elmes' recollection was that Dr Ward requested the administration of 10,000 units of Heparin, assuming the problem was a pulmonary embolus. Heparin is used therapeutically and preventatively. It is very fast acting in preventing or impeding the formation of clots. It has effect when administered intravenously within about thirty seconds. It can be reversed by the drug Protamine.

46. There was no dissent or contrary view expressed by the assisting surgeon, anaesthetists or intensive care doctors in attendance. This was after an assessment had been made that there was not enough blood apparent to explain her collapse. Dr Elmes recalled that there was very limited discussion between Dr Ward and the attending surgeon, Dr Allison, about the possibility of an embolus.

47. Cardiac tamponade had also been considered and excluded. Dr Elmes said Dr Ward had passed a needle into the pericardium to release any aspirate.

48. After the administration of the Heparin, Dr Elmes recalls that Ms Cvitic started oozing from multiple sites intra abdominally. Packs were placed in the abdomen in response to the general oozing which commenced within minutes of administration of the Heparin. Dr Elmes could not remember whether there was any further exploration to discover any particular source of bleeding before the packs were inserted. Pressure was then applied by the fibrous tissue underneath the muscles of the abdominal wall. She was certain the decision to administer Heparin had been made by Dr Ward and the drug administered before the attendance of any other doctors and without reference to them. The skin was not re-closed at this time. Dr Elmes asked to be excused as she had other patients to attend.[21]

49. Dr Allison is a general surgeon who was in between operations on 14 February 2002 when he was urgently requested to assist with Ms Cvitic.

[20] Page 211 , line 45
[21] Dr Elmes had left the theatre before Drs Mundy or Cooke arrived.

The request was from Dr Ward. Dr Allison did not have time to identify exactly who was present in theatre. He referred to it as:

> *"It was such a chaotic circumstance that I was trying to provide the help I was asked to provide….It was very frantic when someone comes to theatre very unwell…….we're all trying to play our role as best as possible to try and help the situation as much as possible."*[22]

50. He thought that the abdominal cavity had already been opened by Dr Ward before he came into theatre. He recalled that there was about 1.5 litres of old blood.[23] He also observed a slight ooze of fresh blood from the right lateral pelvic wall, below the pelvic rim on the right hand side. The standard procedure of packing the abdomen with fresh absorbent pads to tamponade any bleeding and then removing the pads to identify the source was then employed. The lower right pelvic wall was the only area identified as oozing. No active bleeding was identified.

51. Dr Allison said it was Dr Ward that instigated the decision to administer Heparin. No one else discussed the decision. When cross examined about this he confirmed it happened before Dr Cooke was present and in the course of Dr Ward verbalising that he considered pulmonary embolism was the problem. Dr Allison said he knew nothing of the patient's history and did not consider himself to be competent to comment on the senior treating surgeon's decision to order Heparin. He agreed that it might have been different had there been "*frank bleeding*" present. He considered it would be very difficult for anyone to decline to follow the instruction of the treating senior surgeon, including anaesthetists. The anaesthetists did not question the order.

52. Dr Allison confirmed that during the first procedure there was an atmosphere of concern for the patient and a feeling that things had to be done with a maximum of speed consistent with safety. The progression of Dr Ward's thinking appeared to be; it doesn't seem to be a bleeding problem so it must be something else.

53. Dr Allison recalled Dr Ward "*thinking aloud*" and expressing the view that he did not think that haemoglobin of 53 would be enough to cause cardiovascular collapse and that he was considering pulmonary embolus.

54. Dr Allison had no recall of there being a pericardial tap (pericardiocentesis) performed. He could not recall performing one, although there was evidence that Dr Ward did so, prior to Drs Cooke and Mundy being in attendance. Dr Ward's evidence was that he inserted the needle into the pericardiac space and Dr Allison withdrew the plunger to extract any aspirate.

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[22] Page 286,lines 30 – 35.
[23] Page 286, line 49

55. Dr Mark Caporn is an anaesthetist who was working on a casual basis at the Mater on 14 February 2002. He was in the process of leaving after a morning list when Ms Cvitic was brought to the operating theatre. He observed that she was intubated, being ventilated, that she looked extremely unwell and appeared to be near death. He considered she looked profoundly clinically shocked, unconscious and pale. He offered to help the two anaesthetic registrars Drs O'Shea and Andrews.

56. As this was the first time he had worked at the Mater he could not identify the various doctors involved (some who came and went). He was told the senior surgeon who had performed the initial operation was in charge of the operation. This was Dr Ward.

57. On arrival he assessed that Ms Cvitic was in hypovolaemic shock. He had no knowledge of her history and no chance to read the chart. The information was provided by Dr O'Shea who said Ms Cvitic had undergone a radical hysterectomy in previous days. She had suddenly collapsed and become unconscious. A provisional diagnosis was of internal haemorrhage requiring exploratory surgery and treatment. Dr Caporn considered her presentation to be consistent with this information.

58. Ms Cvitic had a peripheral intravenous line in one arm with blood being delivered. Attempts to obtain more venous access for resuscitation (blood and fluid) were unsuccessful because Ms Cvitic was so profoundly shocked. Arterial access could not be gained for the same reason. The anaesthetists could only access the head and neck as the surgeons had prepared the abdomen for surgery. As the anaesthetists could not achieve intravenous access it was imperative for the surgeons to stop the bleeding because the anaesthetists could not replace fluids intravenously. They commenced surgery before intravenous access was established.

59. There were problems with electronic monitoring (excepting ECG) due to the profound shock. The pulse oximeter and blood pressure monitor were not reliable. Therefore Dr Caporn initially monitored the patient's carotid pulse manually and manually ventilated her.

60. Consideration was given whether to administer adrenalin. It was decided against this because, although it would stimulate blood pressure, it might also cause venous restriction which could compromise the only intravenous line in place. Therefore small amounts of intermittent adrenalin were administered through the one line by Dr O'Shea.

61. When the abdomen was opened Dr Caporn saw a moderate to large collection of haemoserous fluid in the belly, reddish brown in colour and dark. Therefore he thought it looked like altered or old blood and not new bleeding. He could not see any new bleeding and the surgeons were unable to locate a source of bleeding.

62. Dr Caporn asked the surgeons to insert an intravenous line into the inferior vena cava after they had drained the abdomen of fluid, which they did. A

second line was then available to administer fluids. Mechanical ventilation was then achieved.

63. He recalled one of the surgeons (Dr Ward) considering that the patient had a pulmonary embolism and asking for 10,000 units of Heparin. Dr Caporn did not recall being asked to give an opinion. Someone from the anaesthetic team gave the drug into the peripheral line. He said he did not see anything, nor was he aware of anything to contradict the administration of Heparin.

Emergency intraoperative transoesophageal echocardiography

64. Other expert opinion and assistance was enlisted to perform a diagnostic transoesophageal echocardiogram (TOE) to confirm the suspected pulmonary embolus. Dr Ward did not request this to happen and was surprised by the arrival of Dr Jennifer Cooke, a cardiologist, who was called in and attended just prior to midday. She had been contacted by Dr Joyce, an intensive care consultant who outlined the situation and asked for her assistance.

65. A TOE shows how the heart is functioning and excludes other possible problems, for example infarct, the failure of heart valves and whether there is an outflow block such as a large pulmonary embolus. The test can also be performed in a variety of situations and does not require the patient to be moved to a CT scanner. The procedure takes 5 to 7 minutes to perform. It is highly specific and determinative of diagnosis to be able to confirm or exclude the existence of pulmonary embolus.

66. Dr Cooke performed both a transthoracic echocardiogram and a TOE and demonstrated there was no embolus present. That determination was made by midday. There was however, some failure of the heart to adequately fill the right ventricle.

67. Dr Cooke noted there was no clear indication who was leading the surgery at the time. She informed the anaesthetist Dr Andrews and the intensive care doctor, Dr Sistla of her result. No surgeon identified himself to her or identified what the understanding of the situation was thought to be. There was no discussion of the possible implications of there being no pulmonary embolus and so Dr Cooke initiated discussion.

68. She raised a possible explanation with the filling of the heart. The lack of volume in one side of the heart might be due to pressure on the heart. A tension pneumothorax was diagnosed and this situation was dealt with by Dr Sistla. There was marginal improvement.

69. At no time was it raised in her presence that blood loss might be the cause of the problem.

70. Dr Cooke then became aware that 10,000 units of Heparin had been administered prior to her arrival in theatre. She acknowledged that it would

have been given in the belief that there was a pulmonary embolus and Heparin would be administered to prevent further clot formation. She could not say that it would be standard practice if the abdomen was open but otherwise agreed with the proposition that it would be appropriate if there was a high degree of suspicion that there was a pulmonary embolus. If however, there was a risk of bleeding, or bleeding already established, Dr Cooke considered that you would need a very high degree of certainty to administer the blood thinning Heparin.

71. Dr Cooke was also then informed that attempted pericardiocentesis had occurred. When Dr Cooke was informed of this and that it had been performed without guidance of ultrasound, it raised the possibility that some harm might have been caused to the heart in the procedure, for example formation of a clot that might be compressing the heart and restricting filling. Dr Cooke recommended a pericardiac window to exclude this as a possibility. Dr Julie Mundy, a cardiac surgeon, was contacted by phone and she agreed that this was an appropriate investigation and that it should be commenced before her arrival. Dr Allison was recalled to theatre and commenced the pericardial window procedure (on advice from Dr Mundy) to obtain a view of the heart.

14 February 2002 - The second operation

72. The second operation on 14 February 2002 commenced at 12.20pm and continued until 15.12pm. In the second procedure, Dr Allison was involved with Dr Ward. Dr Allison had been recalled to theatre. He noted the presence of Dr Cooke, Dr Ward and some anaesthetists.

73. Dr Allison's evidence was that when he reopened the abdomen to perform the cardiac window, he discovered the abdomen was full of blood again. He explained that on the first opening 1500mls of blood had been discovered. They had searched for a bleeding source and had not been able to identify one, except an oozing area in the lower right pelvic wall. The blood had been evacuated and the abdomen packed and pressure applied by sewing up the abdominal wall but not closing the skin.

74. In re-examination Dr Allison considered the "old blood" he observed on first opening the abdomen was not likely to have bled that day. It could have originated from the operation on 11 February 2002.

75. On re-opening he confirmed the abdomen was "*full of fresh blood*"[24] *…."It was very fresh blood, active bleeding.*"[25]

76. Dr Allison said that when he re-opened the abdomen there was a pack down in the region where he had notified Dr Ward there was a bleeding source. The abdomen was full of blood and the pack was sitting in the blood.[26] Dr Allison said that a single pad would have no impact in stopping

[24] page 289, line 10
[25] page 290, line 18
[26] page 291, line 15-20

an ooze or flow of blood. He could not explain for what purpose the single pad would have been left in that position by Dr Ward.

77. Dr Ward's evidence differed on this issue, he said he had inserted two pads and pushed them in to apply pressure below the pubic area.

78. Under cross examination, Dr Allison confirmed his understanding that he had been asked to assist Dr Ward with Ms Cvitic who was returning to theatre for control of bleeding. That was why she was taken to theatre. He confirmed his impression that when the abdomen was first opened he observed what he considered to be old blood. The abdomen was "full of blood" on both openings. It was removed by packs and suctioning. He did not think the oozing from the lower right wall was life threatening. It was sufficient to possibly explain the blood in her abdomen but why she collapsed was uncertain.[27]

79. Dr Allison could not say whether it was venous or arterial blood. He confirmed that there was no external pressure on the heart and there was no cardiac tamponade.

80. Dr Allison then said that the abdomen was being packed again when Dr Carmody arrived in theatre.

81. Dr Allison had his own anesthetised patient waiting for his attention. It was agreed that Dr Carmody would stay to assist Dr Ward and Dr Allison would go.

82. Dr Cooke was present when the abdomen was re-opened. There was immediately a spillage of reddish bloodlike tinged fluid. Dr Cooke was concerned that blood pressure remained as low as 70 systolic. She tried to explain the situation and recalls Drs Sistla and Andrews being involved in the discussion. She did not know Dr Ward at the time but has since identified him. She cannot recall him being involved in the discussion.

83. By 1:00pm, cardiothoracic surgeon Dr Julie Mundy urgently attended in order to explore the possibility of cardiac tamponade. She agreed with Dr Cooke that pulmonary embolus was not occurring because an empty or collapsed right ventricle was inconsistent with a pulmonary embolus. With pulmonary embolus the right ventricle would be dilated, not compressed, because there would be an obstruction to the outflow of the right ventricle. There would be a very high blood pressure between the right side of the heart and the lungs causing the right side of the heart to expand.

84. Dr Mundy was not told that Dr Ward had already performed an attempted aspiration into the pericardiac space using a needle. She was not informed that the patient was hypovolemic or that her haemoglobin was low.

[27] page 295, lines 24-33

85. Dr Mundy observed on her arrival "blood everywhere" and the patient was packed with laparotomy sponges. She observed blood in the suction bottles and on the drapes.[28] The packs in the pelvis were blood soaked with blood rising around them. Dr Mundy confirmed what the general surgeon Dr Allison had already ascertained that there was no tamponade. Dr Mundy confirmed the right side of the heart was under filled. As large volumes of fluid were being administered and lost, the only explanation could be blood loss.[29]

86. She informed Dr Ward of this finding and that she considered the problem to be one of bleeding.

87. Dr Ward said there was only 500-800ml of blood in the abdomen when he originally opened. He maintained the contention of pulmonary embolus and was reluctant to consider blood loss as causing the problem.

88. Dr Elmes' estimate of blood loss in the first laparotomy was between 500mls and 1500mls. The estimate from Dr Allision, the assisting surgeon was "*one and a half litres of blood- not fresh,...it was dark, predominantly blood*."[30]

89. Dr Mundy instructed the anaesthetist to give the patient more blood and to try to make up blood volume. She then left the operating theatre.

90. Dr Mundy was recalled to the Mater later that night and again on 15 February 2002. On both occasions she checked that there was no bleeding problem emanating from the heart, chest or lungs. She noted that the patient was coagulopathic from all raw surfaces.

91. Dr Caporn remembers surgeons re-exploring the abdomen. He saw fresh blood oozing from the pelvis. Forty milligrams of Protamine (which is given to reverse the effects of Heparin) was administered over ten minutes concluding at 1.15pm. He believes he administered this drug at the request of one of the surgeons.

92. The situation was so urgent that Dr Caporn did not make any notes on the record and he is not named in the record as being in attendance. The notes were made in retrospect. He believes the dosages of medication would be accurate but the times probably estimated.

93. When Ms Cvitic's blood pressure had improved and sufficient intra venous access had been established, Dr Caporn left to attend his other responsibilities. Dr Andrews had already left but Dr O'Shea continued together with other staff anaesthetists. The anaesthetic record sheet was attached and explained.

[28] Page 599,line 37
[29] Page 601, lines 1 -10
[30] Page 286, line 49

94. Dr Ram Sistla is an intensive care specialist who was also called to theatre on 14 February 2002 by Dr Joyce. The request had come from one of the anaesthetists in attendance. He arrived at about the same time as Dr Cooke who said she was in attendance from just prior to midday.

95. His assessment after looking at the patient, the monitors and the data was that Ms Cvitic was *in extremis*. She was intubated and ventilated with only her left chest moving as she breathed. Her pulse was of very low volume and her blood pressure was very low. There was a femoral pulse in the left leg but not the right. A central line was in position in the left femoral vein with adrenalin being infused. The anaesthetists had been unable to access the lower part of the body earlier to attempt this. Fluid resuscitation with colloids was also commenced.

96. Dr Sistla diagnosed a right pneumothorax which he drained. The patient's blood pressure improved immediately. He considered this was the main problem compressing the right heart as indicated by the echocardiography.

97. Dr Sistla's statement indicated he thought surgery was disorganised and that Dr Ward was exhibiting stress and was trying to work out what was happening. It was not clear to Dr Sistla who was in charge in the operating theatre.[31]

98. His opinion was that the post operative haemoglobin level of 53g/L indicated blood loss and was sufficient to explain the cause of the collapse.

99. Dr Mathew Carmody is a visiting surgeon at the Mater Hospital and a senior lecturer in surgery at the University of Queensland based at the Mater.

100. In evidence, Dr Carmody told the inquest that after completing the surgery on the 14 February he made personal notes about the day in his office. He then relied on those notes in responding to a request for information from Dr Jenny Brown, Chief of Staff at the Mater in a letter dated 10 April 2002.[32]

101. In his statement[33] Dr Carmody said he was in his office in the University Department of Surgery when he was called by Sister Shields-Brunel and Dr Anthony Colby. The phone call was received about 12.45pm. He recalls being told an emergency thoracotomy was about to commence. His evidence to the inquest was he received a call to come to theatre immediately. The information was that Dr Colby didn't think anyone knew how to open the chest. Dr Carmody immediately left for theatre, arriving about four minutes later, at 12.50 pm. He placed a gown and glasses on. He saw Ms Cvitic on the table soaked in blood. Doctors Allison, Ward, Mundy and Cooke were present. All surgeons were blood

[31] Exhibit C305
[32] Exhibit B39
[33] Exhibit A14

soaked. I note this was consistent with Dr Mundy's description of the scene.

102. He recognised Dr Mundy who had her hand in the chest cavity and was commenting that the patient had a small but normal heart. The chest had been opened through the diaphragm. Dr Carmody was standing about one metre away. There was no pulsatile blood evident. He considered the bleeding had been issuing for quite a while as there were blood soaked instruments and blood on the floor, the drapes and the surgical staff. Dr Cooke was at the patient's side with an echocardiogram machine operating, talking with Dr Mundy. Doctors Ward and Allison were also present. There were up to ten other people in theatre performing various discrete roles. He heard Dr Cooke and Dr Mundy discussing the patient's history, including a cardiac arrest on the ward, being brought to theatre and being given 10,000 units of Heparin.

103. Dr Carmody was first asked whether he could assist with Dr Allison's patient in the adjoining theatre who was waiting for an operation. It was decided that Dr Allison would leave to go to his patient and Dr Carmody would take over from him to assist Dr Ward. There was discussion between the two cardiac doctors concerning lack of fill in a chamber of the heart and also reference to a pneumothorax which had been treated by Dr Sistla.

104. Dr Carmody scrubbed and returned to theatre. He understood the situation was that there was bleeding from the upper abdomen. Bleeding from the heart region had been excluded by Dr Mundy. He could not immediately see a source of bleeding although there was blood everywhere, including blood soaked packs in the abdomen. He approached and stood at the patient's right hand side. He saw blood filling the abdomen, starting to leak over the edges of the skin. He commenced to search the upper abdomen. He quickly decided to act as if it were a serious incident of trauma and pack the abdomen tight with absorbent cotton packs. He addressed the scrub sister and ordered the immediate supply of a large number of fresh packs to apply pressure. Dr Ward packed from the other side of the patient. Ms Cvitic was laying flat, covered in blood soaked drapes. Dr Carmody understood that Ms Cvitic had a very low blood pressure and he directed that her head be lowered to preserve circulation to the brain.

105. Dr Kithsiri Fonseka, Dr Ward's resident medical officer, joined the team in theatre. Doctors Ward and Fonseka then talked through a summary of Ms Cvitic's history since her Monday operation. Dr Carmody heard about her collapse earlier that day when being mobilised by the physiotherapists and the subsequent arrest. He also heard that her haemoglobin was 5 grams per decilitre at about that time. Dr Carmody considered this reading to be less than half what the average expectation would be in the post surgery period for a young woman.

106. Dr Carmody explained that the haemoglobin takes time to reflect a change in circumstances. A graphic example is if a person were to be stabbed and in the process of bleeding to death, the haemoglobin level at that time would still be normal. The lack of volume of blood would be the critical issue rather than the concentration of the blood at the time.

107. Ms Cvitic was apparently in a position where she had lost both volume and haemoglobin concentration which provides the capacity to carry oxygen in the blood.

108. Dr Carmody considered the patient to be in a very risky state and he said he leaned across the anaesthetist's curtain and said words to the effect that *"we need to give her Protamine to reverse the Heparin and stop the bleeding."*[34] He did not hear anyone acknowledge or agree with him. It was said in the presence of Dr Ward who was opposite Dr Carmody.

109. Dr Carmody said, on reviewing the chart some weeks later, he saw that Protamine was given. Dr Sistla's evidence was that it was administered between 1.05 and 1.15pm. Dr Carmody explained that a scrubbed surgeon gives the instruction to the anaesthetist beyond the sterile curtain to administer the drugs as required.

110. Dr Carmody said on hearing her history that she had a normal pulse and haemoglobin the previous night but then precipitously dropped to 5 grams, his opinion was that this did not match with a possible diagnosis of pulmonary embolus. On seeing the blood issuing from the abdomen on his arrival, he was firmly of the view the problem was a bleeding problem.

111. He was asked how he might exclude the possibility of a pulmonary embolus if he had arrived at a time when there was no active bleeding apparent. He said he would review the history of the patient. He conceded that if a patient collapsed on the ward without obvious signs of blood loss, pulmonary embolus could be suspected. The diagnosis is difficult to confirm but includes elevated jugular venous pressure, evident as full veins in the neck. There may be signs of acute right heart strain. An ECG might also show acute right heart strain. A TOE is the definitive test. This was the test being undertaken by Dr Cooke on Dr Carmody's arrival.

112. The TOE had been completed by Dr Cooke prior to Dr Mundy's and Dr Carmody's arrival.

113. While the doctors continued to repack the abdomen with fresh packs there was no evidence that the blood was clotting. The Heparin was having the expected effect. Dr Carmody said he discussed with Dr Ward that he did not think the upper abdomen was the problem area and attention was turned to the pelvis. Dr Carmody suspected there might be bleeding from a hole in the vena cava so he opened the retroperitoneum to inspect further but did not discover a problem.

[34] Page 67, Lines 54 – 55.

114. The situation seemed to be that the upper abdomen was not the area of the source of bleeding. Dr Ward looked to possible areas of concern such as the vessels arising from the sacrum and also reviewed the pedicles which are ligated and divided during radical hysterectomy procedures. These are to be found on the posterior abdominal wall. Dr Ward used "liga" clips to squeeze together cut tissue along the pelvic brim from the operation site. This did not appear to stem the flow of blood. Dr Ward was adding sutures to the pedicles area where the hysterectomy procedure had been performed. This is the fibrous supporting band anchoring the uterus. It did not seem to be the source of the bleeding.

115. Dr Carmody thought he could not see anything from his position to explain the continued bleeding on the left side, so he presumed it might be from the right side. He divided the transverse suture from the operation incision performed on the Monday. This opened up the pelvis allowing a view into lateral recesses in the region of the iliac vessels. He did this from the right hand side and looked back into the recess closest to him and saw bleeding. He asked if he could swap sides with Dr Ward, which was done. He changed the retractor being used by Dr Ward to provide deeper access. He saw a peritoneal defect on the right pelvic sidewall that was issuing blood that he had not seen before from the left hand side of the patient. It was red coloured, fresh blood and non pulsatile. He therefore considered it to be emanating from a major vein, not an artery.

116. Dr Carmody then used an electrocautery pencil (diathermy tool) and activated it to further divide the tissue, exposing another four centimetres of the area. In doing this he pulled the drapes down lower exposing the pubic area and observed a hole in the upper part of the right thigh which was issuing the same coloured blood as could be seen from the abdomen.[35]

117. Dr Carmody was standing on the left side of the patient level with the top of her pelvis. He divided the tissue in a vertical fashion and continued down towards the skin crease itself, towards but not to the puncture that he had seen in the upper thigh. The puncture was two centimetres below the line known as Holden's line delineating the distinction between leg and abdomen. There was fresh blood issuing from this hole and Dr Carmody considered that this was the explanation of the blood loss and consequent drop in haemoglobin and blood pressure. Dr Carmody was seeking to isolate the vessels above and below the bleeding point using the diathermy tool. He assumed the bleeding was coming somewhere from between the hole in the peritoneum issuing blood in the abdomen, and the hole in the upper thigh, which was also bleeding. He considered therefore there was likely to be damage to some major vessel in the five or six centimetres between these two points. He suspected it could be either the iliac artery, or more likely, the vein as the blood flow was non pulsatile. He divided the round ligament to gain better access. He did not discover a

[35] Page 79, line 11

"track" from a drain which he stated can be typically observed through the tissue. He was simply looking to expose the site of the bleeding and affect a repair. He did not cut through the inguinal ligament because it is difficult to repair. He could see enough of the vessels to identify the source of bleeding. Dr Carmody was quite clear that what he observed was a laceration to a vessel which he identified to be the external iliac vein just underneath the peritoneal laceration within the right lateral wall of the pelvis. At that particular point the artery was deeper than the vein and he did not find any damage to the artery.

118. He initially sutured the laceration of the vein with proline suture material. This wasn't successful. He requested a different type of vascular proline which was obtained and the repair effected.

119. During Dr Carmody's exploration of the area he said Dr Ward was saying *"it must be the circumflex vein."*[36] Dr Carmody thought this was not the case because the degree of bleeding was excessive for the far smaller circumflex vein (perhaps 120 times smaller in Dr Carmody's estimate).

120. Dr Carmody assisted the court with an explanation of the anatomy involved, particularly the position of the external iliac vein and artery, the inguinal ligament and associated structures. This was done with the assistance of an anatomical model and anatomical drawings and other representations. He explained the artery has a muscular wall between two and three millimetres thick and is quite robust to withstand tension and pressure as well as traction. In comparison, the vein has a very thin wall only one or two cell layers thick. It is much weaker but it is highly specialised being able to increase and decrease in size depending on local blood pressure. Vein walls are significantly more susceptible to rupture than artery walls. The inguinal ligament is the inferior limit of a three layered dome of the abdomen, holding it in position, a sinew like muscle band from the pubis to the top of the pelvis. Below it is a small aperture for the blood vessels to enter and return from the leg.

121. Further discussion of the anatomy included identifying the inferior epigastric vein and the circumflex vessels which are smaller again than the external iliac vein. The size difference between the inferior epigastric and the external iliac veins was estimated as easily twenty times smaller than the external iliac vein.

122. Dr Carmody informed the court that in a young healthy patient the blood pressure in the iliac artery would be approximately what is measured by the anaesthetic machine, eg if it were 110 millimetres of mercury it would be sufficient to generate a jet of blood a considerable distance if exiting from a small aperture. In comparison, a vein would have no more than 3 to 5 millimetres of mercury pressure. Such blood flow would appear as a trickle, or fall as a curtain rather than be pulsatile from an artery. An

[36] Page 83, line 28

artery has a musculature nature which can tend to close off a breach when pressure is applied- not so a vein.

123. The second attempt to repair the breach in the vessel was successful and haemostasis was achieved. The vessel stopped bleeding.

124. Dr Carmody gave evidence that the puncture mark in the upper right thigh had a slightly V shape rather than a purely round form. Dr Carmody was quite clear that he repaired a vein, not an artery (from the thin nature of the vessel as compared to a muscular arterial wall). His evidence was precise in that he sutured one long tubular tear in the one vein which he identified as the external iliac vein.

125. He said at the time the volume of blood loss was not excessive but having regard to the situation of the patient, with a haemoglobin level of five and requiring huge transfusions, that there had been a bleed from a major vessel. Dr Carmody noted that had it been a defect in the arterial supply to the leg (the external iliac artery) then he would expect the leg to be severely compromised, white and pale which would have been obvious prior to the patient being brought to surgery. He also noted that it was not a pulsatile flow which would be expected from an artery.

126. Dr Carmody reflected on the procession of events after surgery. He noted that the patient seemed to be recovering after surgery uneventfully until 14 February when something catastrophic occurred. He reviewed the operation notes and noted that two drains were used. He formed the view that the drain exit wound might be the explanation for the puncture wound in the upper right thigh. This would be consistent with the probable path of the sharp metal trochar used to pierce through to exit the drain between the points where he had observed a defect in the peritoneum (which was at the outer limit of the original transverse surgical incision) leading down to the puncture wound below in the upper thigh. The damaged external iliac vein was between these two points.

127. He could not discover any other explanation for the puncture wound in the thigh. He considered it might have been possible that an attempt to insert a cannula during resuscitation might have misguidedly caused such a puncture (as it is not the correct spot), but could find no confirmation that this was the explanation of the wound. He also thought a cannular mark would exhibit a “round” puncture appearance whereas the puncture he observed was of a diamond or V shape, more consistent with the passage of the trochar.

128. The drain tubing which remains within the patient is fluted only up to a marked point which shows where the tube should exit the skin. The fluting allows the fluid to be extracted via gentle vacuum pressure. Other types of drains have holes but tend to block.

129. Dr Carmody was asked whether injury to the external iliac vein might have otherwise occurred in the course of the initial procedure being

undertaken. He raised the possibility that damage might be associated with removal of lymph nodes in the iliac area but if this was so, then it would still raise the question why the collapse was delayed until the third post operative day after the initial operation on the Monday.

130. Dr Carmody considered there must have been some significant change in the patient's circumstance to suddenly precipitate her to the dire collapse of 14 February. He could not entertain the notion that the bleeding had commenced from the time of the operation and not revealed itself. He considered that it must have commenced perhaps in the early hours of Thursday morning. He raised the hypothesis that the passage of the trochar had caused the damage to the iliac vein but this had been effectively tamponaded by the drain itself, within a very confined space held in place by the inguinal ligament. He considered this could be an explanation given the vessel was a low pressure vein rather than an artery. It was on Thursday morning that the drain had become loosened and fell out. The fluting would then permit the outflow of blood. In a young fit person the body would compensate for a period of time before final collapse which had occurred. Blood would also then be flowing into the abdomen which might not be immediately apparent.

131. Homeostasis was achieved by oversewing the external iliac vein. Dr Carmody's recollection was this happened by about 3.00pm. Dr Carmody could see that clots were now beginning to form and he considered the best course was to pack and close the patient as soon as possible and get her to ICU to be warmed and cared for in that controlled environment.

132. I remark that Dr Carmody does not seem to have been aware that Protamine had been administered or at what time this in fact occurred but he could observe the positive clotting effects by 3.00pm.

133. Dr Carmody considered Ms Cvitic's chances of survival were low, given the prolonged period of low blood pressure and the likelihood of severe acidosis. Without sufficient blood supply, tissues would be unable to be relieved of their toxic by-products and irreversible damage to organs can result. Huge blood loss and the need for transfusion was the other most significant deficit faced by Ms Cvitic as this time.

134. The abdomen was repacked by both Drs Carmody and Ward and the opening closed with adhesive to add pressure and save time. Dr Ward made a temporary repair with a stent to the ureter which had been moved and compromised during the search for and repair of the bleeding site.

135. The plan was to reopen and replace the packs as required. Ms Cvitic developed cerebral oedema as a reaction to the massive blood loss and prolonged hypotension. Dr Carmody performed a further laparotomy on the 20 February to check the abdomen.

136. A subsequent laparotomy on 20 February provided the opportunity to review the repairs made to the external iliac vein. Dr Carmody recorded in

his notes at the time that the vein was healthy and functioning and the repair had been effective.

137. Mr Tait SC clarified that there was no opinion expressed by anyone, including Dr Ward, contrary to Dr Carmody's strongly expressed view that Protamine should be given. Dr Carmody confirmed that there is a surgeon in charge but it is a team effort. Dr Ward was the lead hand and when Dr Carmody was called in, he was able to provide assistance and effectively took over the lead when he swapped sides with Dr Ward and went on to discover the source of bleeding and repair it. By the time Dr Carmody started operating it was overwhelmingly clear that stopping the bleeding was the problem to be addressed. Dr Carmody rejected a suggestion that it was avulsion of the epigastric vein.[37] He again explained the basis of his interpretation of events was that when a glancing injury to the iliac vein was caused at the time of the original operation, a tamponade effect resulted by the position of the drain wedged beneath the inguinal ligament and within supported tissue. When the drain became dislodged, bleeding commenced resulting in the subsequent collapse and rapid decline after the removal of the drain and the release of the tamponade effect.[38]

138. Dr Carmody noted that the original laparotomy was opened with a mid line incision, running down the middle of the abdomen, and it was therefore not likely that the ultimate source of bleeding could be seen from that incision. All that was recorded as being seen at the first operation on 14 February was presence of blood tinged fluid and old blood, up to one and half litres, but no active site of bleeding. He agreed that the non pulsatile nature of the flow and the low volume of blood by that time would have made it harder to locate the source. He also explained that intravenous fluids could be diluting the haemoglobin level in the blood and a drop in haemoglobin does not necessarily equate to blood loss.

139. Dr Carmody would not concede that bleeding could be discounted as the major problem when only old blood and fluid was seen and no active bleeding was discovered. He held his opinion because the midline incision did not give access to the whole abdominal area of the previous surgery which had been via transverse incision and also because of the low haemoglobin reading. He was steadfast in explaining the basis for his opinion that the problem was always a bleeding problem:[39]

> "*A haemoglobin of five would normally....meet a criteria for blood transfusion and given the situation of a patient that had a hypovolemic collapse in the ward with a low blood pressure yet maintaining reasonable oxygen saturations coupled with a haemoglobin of 5 grams per decilitre, I would say that, in balance of probability, blood loss would still be the obvious cause for that."*

[37] Page 129, line 10-15
[38] Page 130, lines 10-40
[39] Page 138, lines 35-46

140. Dr Carmody's view was that a systematic full and repeated package of each quadrant of the abdomen was required before bleeding should have been excluded. There was also further discussion of the development of an arterio-venous fistula which occurred after 14 February when Ms Cvitic was in intensive care. This was diagnosed conclusively and indicated communication between the external iliac vein and artery. This was of very small size initially a pinhole but with the resumption of normal blood pressure could enlarge to then demonstrate the arterio-venous fistula.

141. I will not detail that matter further, as for the purposes of establishing the cause of death it is clear that the events from 11 to 14 February are sufficient.

142. Further questioning highlighted there had been blood losses from the right drain wound itself over a number of days. These losses were not included or capable of measurement as they were absorbed by dressings. The lowered haemoglobin of 5 at the time of collapse is consistent with dilution of the concentration of the blood due to bleeding over a period of time.

Dr Ward's evidence

143. Ms Cvitic was a public patient under Dr Ward's care. Dr Ward had the assistance of a hospital registrar and a resident shared with another consultant. He was a visiting medical officer (VMO) at the Mater. The house staff cared for the patients who are then regularly reviewed by the VMO. He was unaware of Ms Cvitic's condition the day prior to her collapse. At the inquest he placed some emphasis on the notes referring to vomiting and low urine output on the Wednesday but he had not previously raised this at other forums reviewing Ms Cvitic's care. The hospital staff had power to order haemoglobin tests and Dr Ward said he was always accessible by phone. [40]

144. Dr Ward saw Ms Cvitic the day after surgery on 12 February and then when she collapsed on 14 February 2002.

145. On the issue of whether or not Dr Ward advised his registrar to perform blood tests post surgery, Dr Ward said he did not discuss the protocol document that he assumed was given to all registrars such as Dr Elmes. He said the nature of the document was that it should be followed. The document indicated blood tests should be ordered on the first day after the operation on 12 February. He said there was general discussion with Dr Elmes that there was a degree of discretion in ordering tests. Dr Elmes evidence differs on this point. I also note Dr Ward saw the patient with Dr Elmes on 12 February and there does not seem to have been any discussion about the absence of blood tests.

[40] Pages 930 – 931.

146. On 14 February Dr Ward came to the ward after Dr Elmes contacted him to tell him of Ms Cvitic's collapse. He said Dr Elmes told him there had been an uncontrolled removal of the drain. The patient had been unwell; she had deteriorated and had lost consciousness. He agreed he observed abdominal distension. He did not recall Dr Elmes referring to an appearance of blue colour on the skin along the transverse incision line. He was told her haemoglobin was 53, compared to 113 pre-operatively. He thought there was intra abdominal bleeding. He agreed she was also tachycardic and had low blood pressure. He agreed the indication was that she had lost about half her blood volume. [41]

147. He agreed that blood tests, particularly had they been taken on the second day post operatively, may have assisted in alerting a situation of blood loss. However, his view was that if a patient appeared well then there was little benefit in having a standard test. He acknowledged in hindsight that by Wednesday afternoon, Ms Cvitic's condition post operatively did call for the test due to her low urine output, nausea and vomiting. Intravenous therapy had also been ceased. He was unaware of the condition of the patient at that time. The decision to do the tests, specifically for electrolytes balances, was in the hands of whoever was caring for Ms Cvitic at the time.

148. Dr Ward said Ms Cvitic was taken to theatre and he was assisted by Dr Allison. A midline incision was made and the omentum (fatty layer) was released and moved aside. The transverse incision from the previous operation remained closed. There was between 1 to 1.5 litres of blood but it did not appear to be fresh bleeding. Dr Ward called it "*old blood*", predominantly old blood. He was perplexed that there was no immediate cause of bleeding and collapse. He asked for some blood to be tested. He inserted a large bore cannula into the vena cava at the request of the anaesthetists and the abdomen was inspected quadrant by quadrant and fluid evacuated. No bleeding site was identified. There was some ooze from the cut surfaces of the peritoneum. The operation had started by 11.00am and it was about 11.30 by this stage.

149. Dr Ward says there was some form of discussion between Drs Allison, Andrews and himself. Dr Allison's recollection is he did not participate as such in any discussion. Dr Ward agreed he was "discussing" the case with Dr Andrews, the anaesthetist. He recalls Dr Sistla being there but not participating in the discussion. He expressed that he could not understand why Ms Cvitic had not improved even though they had replaced volume for over an hour and she had been resuscitated. He thought her circulating blood volume would have been normal but was aware that the haemoglobin level was low, consistent with dilution. Therefore he considered that if the problem was not volume it must be output. He thought the heart might be impeding pumping blood out because of pericardial tamponade or due to a pulmonary embolus.

[41] Page 877, lines 47-48

150. Dr Ward said the easiest diagnosis to exclude was cardiac tamponade and he immediately performed a cardiac tap of the pericardium by passing a narrow gauge needle with a syringe into the pericardial space. Only clear fluid was present. Dr Ward says he inserted the needle and Dr Allison withdrew the plunger. By this means he considered that cardiac tamponade was excluded.

151. Dr Ward then felt that pulmonary embolus was the remaining option to explain the situation. When pressed he could not state a specific recollection that Dr Andrews had expressed agreement with him. Dr Ward says he was thinking how this could be confirmed. He said he was trying to think how to stabilise the patient. He said:

> "*I think my justification for asking for the Heparin was that if she was going to live long enough to do that (have a CT scan) we had to stop her dying now."*[42]

152. Dr Ward says he expressed that he wanted Heparin given and that Dr Andrews discussed it with his consultant and it was given. He could not recall the details of any of the conversation.

153. Dr Ward explained why he ordered Heparin. He said Heparin would only have a very minor effect on a clot. Heparin does not assist in breaking down, moving or removing the clot but it may allow some blood to get past a clot by relaxing the vessels. It would inhibit the formation of more clots. Dr Ward's thinking was that the patient had been resuscitated after what he assumed was a large pulmonary embolus but was at risk of a second fatal embolus. He decided that the appropriate dose was 10,000 units of Heparin. He admitted that this was twice the normal dose he would use which he explained reflected his level of anxiety at Ms Cvitic's condition. He wanted to be certain that the Heparin would prevent further clot formation. He agreed that prior to the initial operation he had prescribed the prophylactic Clexane at the standard dose of 40 mgs. He acknowledged that 20 mg may have been sufficient for a woman of Ms Cvitic's size.

154. Dr Ward agreed that the basis of his diagnosis of pulmonary embolus was that he had expected to find bleeding and had not. The only conclusion he could then arrive at to explain her condition was a pulmonary embolus.[43] Dr Ward pointed to the fact she had stopped breathing on the ward and her rapid heart rate as signs of pulmonary embolus but he could not identify any of the other classic indicators such as tachypnoea, pleuritic chest pain, non-productive cough or accentuation of pulmonic valve second sound. Elevated venous jugular pressure had not been demonstrated or observed. Dr Ward acknowledged that in ordering Heparin he would exacerbate the bleeding from any raw surfaces or any other bleeding sites that had not been found. He considered that he

[42] Page 890, lines 49-54
[43] Page 889, line 9

had excluded the presence of other bleeding sites. He had observed and packed the abdomen in quadrants. There was only ooze from the right lateral pelvic wall.

155. He was challenged that he should not have excluded bleeding when there was an estimate of at least 1 litre of blood in the abdomen on opening and there had been post operative drain collection of at least 900mls. He disagreed that this was mainly blood and said this would have included lymphatic fluid. He agreed he had seen the blood on the sheet from the right drain site when Ms Cvitic had collapsed. He considered this merely consistent with an uncontrolled removal of a drain.

156. After the Heparin was given there was more bleeding apparent from the right pelvic wall and he used surgical cell cloth to promote clotting as well as oversewing cut surfaces. Dr Ward said he achieved haemostasis and placed two packs down in the right iliac fossa to provide support for that area. The packs were jammed between the pubic bone and the sacrum. Dr Ward said he didn't have an opportunity to take any steps to arrange for Ms Cvitic to have a CT scan to confirm the embolus before the arrival of Dr Cooke. He had not told anyone in the theatre to take any steps towards organising the CT scan. He said that resuscitation was not yet complete so he sewed up the sheath with the two packs in place but left the skin open. He said the aim was still to make her condition stable. He thought he had made it clear to the anaesthetists that the Heparin was given and then she needed to be stabilised to be taken to have a CT scan to confirm the pulmonary embolus. He agreed the administration of Heparin alone without any other follow up would not address the problem as it appeared to him.

157. Dr Ward told the inquest he had no knowledge of how or at whose behest Dr Cooke arrived. He later became aware that Dr Joyce had arranged for her to attend. It had not been discussed with Dr Ward. He said he was working on the assumption that a CT scan was the mechanism to test for pulmonary embolism and he was unaware of the availability of a TOE.

158. When asked why he had not arranged for relevant specialists to attend to confirm his preliminary diagnosis of pulmonary embolus, Dr Ward responded that this was the responsibility of the intensive care team who were present. He could not recall any discussion with that team, only with the anaesthetist, Dr Andrews. He expected that the anaesthetists would manage the embolus problem. In his experience the intensive care team would conservatively manage a situation of pulmonary embolus. I remark, at this time, that he seems to have pre-empted this by ordering the administration of Heparin at an early stage.

159. The computer record made by Dr Ward concluded with post operative instructions to take the patient to the ICU. There was no reference at all to the requirement for a CT scan. Dr Ward sought to explain this on the basis that Ms Cvitic needed to be stabilised in ICU before going for the scan. He

expected that she was going to be ventilated and then, within an hour or two, have the scan. He said it had been urgent to give the Heparin to prevent further embolus, not so much to take the scan which he expected would confirm the existence of pulmonary embolus.

160. Dr Ward agreed that Dr Cooke attended and performed a preliminary test which indicated that a pulmonary embolus was not evident. This was conveyed to Dr Ward by about midday. Dr Ward said that the situation still remained clouded because Dr Cooke provided information that the patient had a "*mass lesion in her chest*".[44]

161. Dr Ward did not dispute that if this was the case, the Heparin could not treat that condition and he knew the Heparin was already causing some bleeding of the cut surfaces. Dr Ward explained he was "*diverted*" by the issue of a thoracotomy. He advanced this as the explanation of why he did not immediately order Protamine to reverse the Heparin.

162. The possibility of a mass in her chest led to Dr Allison being recalled to make a pericardial window. Dr Ward agreed there was certainly fresh blood apparent when Dr Allison opened the abdomen on the second occasion. He was assisting Dr Allison in this procedure. Dr Ward disagreed with Dr Allison's assessment that the abdomen was "*full of fresh blood*". Dr Ward said this could be new bleeding or from the surfaces he had attended to earlier. He was asked why he did not, given the fresh bleeding, immediately order Protamine to reverse the effect of the Heparin. Again he said he was diverted by the thoracotomy.

163. Dr Ward said it was only at the end of this procedure that it was evident that bleeding was increasing and this was after Dr Mundy suggested the heart was not filling properly, indicating a significant circulatory collapse. He said the bleeding was not so great as to divert them from operating in the chest area. Again he said he was attending to this rather than considering whether Protamine should have been ordered. The situation was fraught and tense.[45]

164. Dr Carmody then arrived and Dr Allison left theatre to attend to his own patient. Dr Ward agreed that by this time the bleeding was quite significant. Dr Carmody instigated the order for Protamine. This was before the two surgeons changed sides to enable Dr Carmody better access to look for the bleeding site. Dr Carmody was being assisted by Dr Ward.

165. Dr Ward agreed that they both observed blood issuing from the right drain site. Dr Ward disagreed that the location of the drain site was two centimetres below Holden's line.[46] He expressed it as two centimetres below the skin crease in the patient's abdomen. He demonstrated on the anatomical model available to the court a point about two centimetres above the cut section revealing the inside of the abdomen. Dr Ward could

[44] Page 902, line 15
[45] Page 904, line 34-37
[46] Page 906, lines 1 - 10

not recall a hole below Holden's line. He could remember Dr Carmody pulling the drapes down to reveal the hole with blood issuing from it. He thought that this hole was the drain exit hole. He agreed that Dr Carmody then dissected down to the source of the bleeding with the aid of a diathermy tool. Dr Ward thought the source to be a vascular structure below the rectus muscle.

166. He could not identify the vessel, whereas Dr Carmody was clear in his evidence that he identified the vessel at the time to be the external iliac vein. Dr Ward considered the vessel could be the external iliac vein or one of its tributaries or an aberrant venous pool of some sort. Dr Ward agreed that Dr Carmody sutured the defect he found thereby achieving haemostasis. The patient was then observed for a period before her abdomen was repacked and closed and she was taken to intensive care.

167. Dr Ward told the inquest he could remember where he had placed this particular Blake's drain in Ms Cvitic's right hand side. He said he placed it in the standard position, as always, exiting from the right abdominal wall below the transverse operation incision and above the line delineating the distinction between abdomen and leg, known as Holden's line.

168. When asked about the period when he was effectively assisting Dr Carmody in exploring the lower right area of the abdomen for the source of the bleeding, he agreed with Dr Carmody's evidence. He was asked:

> "*And were you aware he dissected using the diathermy down to a location, that is did you participate in the sense of either assist or observe it?*
>
> *I assisted.*
>
> *Now, that was preceded by him asserting to you perhaps that there was blood issuing from the right drain site, wasn't it?*
>
> *I think we both observed that, yes.*
>
> *You both observed it?*
>
> *I think so.*
>
> *He says what he was looking at was the spot two centimetres below the skin crease in the patient's abdomen."*[47]

169. However, Dr Ward pointed to a spot on the model in court to indicate that his recollection was that the exit point was a centimetre or two above where the Holden's line would be. He said he does not have any recollection of a hole below Holden's line from which blood was issuing.

[47] Page 905,lines 1 - 11

He did however agree that he saw a hole from which blood was issuing which he thought was the drain exit hole.[48]

170. Dr Ward says he could not identify from which vascular source the blood was issuing. He considered the possibilities to be from the external iliac vein, one of its tributaries or an aberrant venous pool of some description. He agreed that Dr Carmody sutured the bleeding vessel and stemmed the flow but he was not sure it was the external iliac vein. He said that Dr Carmody did not express a view or comment that the drain exit point was in the wrong place on 14 February. Dr Ward became aware of that view later on.

171. Dr Ward was asked about his notes made after the first and second laparotomies and his statement made in May 2003. [49] He admitted that in these notes he wrongly justified the use of Heparin to restore cardiac output. He conceded that Heparin would not have this impact. He also agreed that the record did not refer to what he told this inquest was the real reason he administered Heparin, namely to stabilise the patient to enable a CT scan to be taken to confirm the suspected diagnosis of pulmonary embolus.

172. There was no reference in either operation note as to the reason why Heparin was administered. There was no explanation in his letter to the Medical Board why Heparin was administered. Dr Ward said there was only one reason, to stop the patient dying in the immediate future. Dr Ward's response to the Medical Board did not dispute the underlying assertion that Dr Carmody had seen the Blake's drain exit puncture below Holden's line, in an inappropriate position. [50] Dr Ward's statement to this inquest did assert that the Blake's drain exited in the normal fashion, namely through the abdominal wall and not below Holden's line, as Dr Carmody had raised by that time.[51] Dr Ward however, said he always maintained the position that the Blake's drain had exited the abdomen wall in accordance with accepted practice.

173. Dr Ward confirmed that he was the person present in the operating theatre with ultimate responsibility and decision making authority regarding the patient and it was his decision to give Heparin in the amount of 10,000 units.[52]

174. Dr Ward explained to Ms Dalton SC that he considered the declining haematocrit[53] and haemoglobin levels to mean that Ms Cvitic had been slowly bleeding over some time prior to her collapse of 14 February. She had been compensating up to that time before her collapse.

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[48] Page 906, line 19
[49] Exhibits A16,C99L and C99M; Transcript Pages 979 – 980.
[50] Exhibit A 40
[51] Exhibit A 16
[52] Transcript Page938, lines 44 -51
[53] Page 939, line 20. Haematocrit refers to the proportion of the blood which is red blood cells.

175. His evidence was that he could specifically remember where he had placed the drain in Ms Cvitic. He said it exited through the abdominal wall which was contrary to the position of the puncture wound in the upper thigh which Dr Carmody presumed to be the exit wound for the drain.

176. Dr Ward said it was about 11.30 or 11.40am that the Heparin was given. The result of Dr Cooke's TOE was known by midday. There was no pulmonary embolus. Dr Cooke arrived while Dr Ward was making computer notes after the first laparotomy. He could not recall that Drs Allison and Andrews had left by this time. He did not know who had called for Dr Cooke. Dr Ward said there were no signs of bleeding at the time he became "*unscrubbed*" to make the operating notes on the computer. Dr Ward said he was relying on the intensive care specialists to follow up with the embolus issue but he could not identify any of the intensive care doctors nor recall discussions with anyone except Dr Andrews, the anaesthetist. It seems he did not know any of the intensive care doctors who attended.

177. Dr Cooke explained what she was doing and the results, that there was not a pulmonary embolus present and the right side of the heart was very small. Dr Ward's evidence was that he accepted this but he said he still did not know what caused the initial collapse. Dr Cooke recalled there was no response from anyone on the surgical side of the table and so she raised some issues aloud. She said no-one took charge and therefore she stepped into the vacuum.

178. After Dr Mundy attended Dr Ward said he accepted that the cause of the collapse was bleeding and that Ms Cvitic was hypovolemic.[54] However Dr Ward said that although he accepted it was blood loss that caused the collapse, he was "*not able to explain how it occurred and where it happened and where it (the blood) went".*[55]

179. Dr Ward finally conceded that no other cause had been found and that Ms Cvitic had a significant bleeding problem. Cardiac tamponade, pulmonary embolus and cardiac arrest had all been ruled out. Dr Ward's problem with accepting it was a bleeding problem centred around his questioning of where did the blood go?

180. Despite conceding that Dr Carmody had the better view to identify the bleeding source which Dr Carmody repaired, Dr Ward would not agree with Dr Carmody's opinion that it was the exterior iliac vein that Dr Carmody found to have been breached and duly repaired. All he would say was, "*or very close to it*" or it was possible it could be that vein (or a varicose vein or inferior epigastric vein).

181. He agreed the bleeding was controlled by Dr Carmody oversewing the vessel. Dr Ward's view was that with the amount of resuscitation fluids that

[54] Page 958, line50-60
[55] Page 959, lines 34- 35

had been given, then such a tear in the external iliac vein could not have been there at the time of the collapse of the patient.

182. Dr Ward did not agree that the ooze in the region of right pelvic wall was related to the tear in the external iliac vein. He explained the vein was close to the surface and if there had been bleeding from it this would have flowed downwards into the recumbent Ms Cvitic, who was lying on the operating table, into the depths of the abdomen. He did not observe this to be the case. The blood found was deep within the abdomen.

183. Dr Ward agreed that venous blood can appear to be darker in colour and will clot when there is fresh bleeding. However, although he saw some clots when the abdomen was first opened he still thought it was old blood not fresh venous blood.

184. It was clarified that Dr Ward oversewing the common iliac had nothing to do with stopping the patient's bleeding. This was to close the entry point for the cannula inserted by Dr Ward to assist resuscitation into the vena cava. His evidence at the inquest was uncertain as to the identification of the vessel oversewn by Dr Carmody. [56]

185. Dr Ward agreed that the bleeding causing the patient's problem was coming from the right drain site.[57]

186. Dr Ward thought that the collapse may relate to damage caused when some part of the vascular system was avulsed when the drain came out in an uncontrolled manner.

> "*The difficulty with that was, of course, that supposed catastrophic event could not be demonstrated when we had her tummy open."*[58]

187. Dr Ward confirmed that he was sure that Dr Carmody did ask him if the patient could receive Protamine to reverse the Heparin. He believes that Protamine was given within five minutes of Dr Carmody arriving. [59]

188. Dr Ward voiced the confusion he felt when other people were contacted without his knowledge and brought into theatre on 14 February. Had he been informed that a cardiologist was being contacted to perform the TOE (which I note was a test he was unaware of) he considers he may not have given the Heparin.

189. Dr Ward conceded that by midday, when Dr Cooke had excluded the possibility of pulmonary embolus, it would have been appropriate to administer Protamine.[60] Dr Ward explained he was diverted from this by

[56] Page 979, line 40
[57] Page 984, lines13-20
[58] Page 991, line 50
[59] Page 999, lines 18 - 30
[60] Page 1012, lines 21-24

the "*false trail*" being investigated of a small right side of the heart and possible causes for this. He said this investigation remained an issue until about five minutes before Dr Carmody arrived.

190. Dr Ward's evidence concluded:

> "*I think it's impossible for anyone to understand those situations….I responded to the situation as I felt with the knowledge that I had and with,…a considerable amount of experience. As it turned out, my choices were not correct, but I think they were reasonable."*[61]

Expert opinions on Ms Cvitic's status at end of procedures on 14 February

191. Dr Kruger, is the director of intensive care at the Princess Alexandra Hospital.[62] He reviewed the information and told the inquest that in his experience he had not seen a patient recover from a situation where their PH level was 6.5. This level was recorded at 11.10am on 14 February for Ms Cvitic and indicated severe acidosis which was highly unlikely to be reversed. When cells in the body do not receive sufficient oxygen through the blood they cannot maintain functional cell status. Acid levels in cells build up and the poisonous effect damages the cell to the point that they cease to function. Ms Cvitic had already developed this serious state of acidosis prior to her arrival at theatre on 14 February and it was this condition that most likely explains the collapse. Massive blood loss precipitated the onset of acidosis and restoring the circulation was critical in addressing the issue.

192. Dr Stuart Miller was called as an independent expert in the field of respiratory medicine, anaesthetics and intensive care.[63] After review, he considered the most likely causes for the collapse on the morning of 14 February 2002 were low circulating blood volume and excess vagal tone. Fluid intake had reduced after IV fluids were stopped on 13 February. Oral intake was limited by nausea, vomiting and leakage of serous fluids from the drains. The mildly elevated urea level is consistent with low volume. Urine output was also lower.

193. Dr Miller interpreted the ECG at 10.28 on 14 February (where the P wave was absent) as indicating excess vagal nerve tone which may have contributed to reduction in cardiac output. These factors led to low blood pressure, inadequate blood and oxygen supply to the brain and resultant loss of consciousness.

194. Low blood pressure continued due to the impact of positive pressure ventilation and a tension pneumothorax. Continuing low blood pressure was significant because life threatening acidosis was developing (blood tests at 10.00 and 11.10 on February 14). He considers the metabolic

[61] Page 1013, lines 15 - 22
[62] Exhibit A32
[63] Exhibit A38

acidosis was due to lactic acidosis which he concludes was caused by tissue hypoxia due to shock.

195. With the benefit of hindsight between 10.00am an 11.10am on 14 February Ms Cvitic was profoundly shocked and had already sustained major damage to deep organs, due to low blood pressure sufficient to have caused severe acidosis.

196. The ongoing decline was due to disseminated intravascular coagulation, triggered by shock, metabolic acidosis, tissue ischaemia and massive transfusion therapy. Homeostasis was achieved by oversewing the external iliac vein but the patient remained with a significant coagulopathy which ultimately led to her death.

197. Dr Miller, summarised the situation as follows:

> *"My opinion is that severe organ damage had been established by 11.10am and the chance of survival prior to the Heparin dosing was less than one chance in two. In other words, I would predict the chance of survival at this stage ranges from no chance to 50%. This is based on my knowledge of the case and experience managing perhaps dozens of patients with severe shock and metabolic acidosis."* [64]

198. Dr Miller considered that it was reasonable to give Heparin because on surgical exploration there was no evidence of acute bleeding found. He therefore thought it reasonable to proceed to the second differential diagnosis which was pulmonary embolus. If untreated, pulmonary embolus has a mortality risk of thirty percent. He considered Heparin the standard initial treatment. A risk benefit analysis had to be made and he assumed that all doctors present would have been aware of possible implications of the risk of bleeding, weighed against lack of anticoagulation. This was an emergency situation.

199. The overall effect of this evidence is that after the events of 14 February and the conclusion of operative procedures on that day, there was an inevitable and irreversible decline until death which occurred on 21 February 2002. I therefore do not refer to the events after this time period.

200. Dr Miller acknowledged that in fact the Heparin did contribute to a bleeding problem but he noted that this was also added to by the resumption of blood pressure and the onset of acidosis.

201. Dr Miller referred to Heparin having a half life of 90 minutes, i.e. in 90 minutes half its effect is lost after a single dose. Continuing transfusion would reduce the impact of the Heparin and Protamine was given later to

[64] Exhibit A38

reverse the effect of Heparin. Dr Thiele commented that the double dose of Heparin would mean its impact would be prolonged in time.

Expert Reviews

202. Professor Alex Crandon, Director of Gynaecology, was requested by the Chief of Medical Staff at the Mater to review ten of Dr Ward's patients.[65] He did this in conjunction with Dr Russell Strong but they decided at the outset to review the files independently and to submit separate reports.

203. A summary of Professor Crandon's opinion about Dr Ward's management of the patient was that the surgical treatment of carcinoma of the cervix was acceptable. He disagreed with the hypothesis of pulmonary embolus. Ms Cvitic was a smoker which he said made her less likely to suffer pulmonary embolus and she was receiving subcutaneous Clexane of 40mg per day. He noted this to be a considerable dose for a fifty two kilogram patient. This dosage of Clexane plus 10,000 units of Heparin produced a totally anti-coagulated patient, magnifying intraoperative bleeding problems. There had been no post operative haemoglobin estimation and no exact record of intra operative blood loss. This made it difficult to work out where the patient lost 6 grams of haemoglobin. [66]

204. Professor Crandon's starting point was that it was unlikely that the external iliac vein could be lacerated in surgery. He then noted and regarded Dr Carmody's observations in surgery and repair of that vessel, a nurse's notes indicating packing around the drain in the right thigh and Dr Carmody's reference to blood flowing freely from cutaneous puncture of drain inferior to skin crease.

205. He inferred this meant the drain was through the groin and into the upper thigh causing damage to the external iliac vein. Assuming this to be the case, he considered the insertion of the drain in such a manner was below the standard expected of a surgeon.

206. Professor Crandon's impression was that, although not precisely recorded, blood loss during the operation was excessive. Overall Professor Crandon was concerned with Dr Ward's clinical judgment.

207. Emeritus Professor Russell Strong defended his appropriateness to review Dr Ward's treatment of Nardia Cvitic which had been challenged by Associate Professor Jobling.[67] Exception had been taken because Professor Strong was from a different specialty and was from the same city. Professor Strong referred to his long surgical history including, relevantly, trauma with vascular complications and experience in pelvic, colon and rectum procedures requiring hysterectomy. He also assisted Professors McKay and Cockburn during the seventies and eighties in

[65] Exhibit A35 (CV)
[66] Exhibit B25 (Statement)
[67] Exhibit C315 (CV)

radical resections for gynaecological malignancy and also kidney transplants involving the iliac vessel. [68]

208. I accept Professor Strong's expertise to comment on this case.

209. Professor Strong remarked on the short time for the extensive and complex surgery involved. Although noting that Ms Cvitic was thin and that Dr Ward might be quick and manually dextrous in technique, his overall impression was that the time was too short.

210. He noted there had been nausea, vomiting and pain in the two and a half days after surgery but that this could not explain the catastrophic events that occurred on 14 February 2002.

211. In his view the loss of the drain was significant. He noted there was no accurate record of blood loss from the operation of 11 February referred to by Dr Elmes as between 600mls to one litre. Loss from drains was recorded as 290mls whilst in recovery between 1600 and 1830 hours on 11 February (260mls from right drain). On 12 February 2002, there was 200mls in drains at 6.40am (175mls from right drain and 25mls left drain) and on 13 February 2002, 680mls was recorded. That was a total blood loss of 1170mls between the 11 and 13 February 2002.

212. Additionally, there were notes of ooze around the drain sites which would include serous fluid and would not all be whole blood.

213. Professor Strong had regard to the pre operative haemoglobin of 113gms/litre and the post collapse reading on 14 February of 53gms/litre. At fifty two kilograms in weight he estimated her full blood volume to be 3,500mls, half of which is 1750mls. Ms Cvitic had therefore lost approximately half her blood volume. Any additional sudden blood loss on 14 February was therefore very serious.

214. Professor Strong was bewildered at a direction not to take post operative haemoglobin asserted by Dr Elmes to be Dr Ward's direction.

215. Professor Strong also noted that Ms Cvitic was dehydrated due to limited oral intake and vomiting. This was evident in the limited urine output in the twenty four hours before collapse. When this was considered with the reduced blood volume, Professor Strong considered that it would not require a large intravascular volume loss to cause a sudden collapse as occurred on the morning of 14 February 2002.

216. His considered view of the immediate cause of the collapse was haemorrhage from the external iliac vein. He discounted the proposition that an embolus precipitated the collapse as it would have to have been very large to cause such collapse. Veins are high volume, low pressure

[68] Exhibit C304

vessels and being very restricted in the iliac vessels he dismissed the possibility of an air embolus.

217. Professor Strong noted Dr Elmes' observation immediately after collapse that Ms Cvitic had a distended abdomen. After resuscitation this had increased and bruising and discoloration had appeared around the wound and "*looked like blood under pressure*".

218. At the first emergency operation on 14 February about 1500mls of dark blood and clot was found in the pelvis. He noted that Dr Ward did not consider this to be sufficient to be the cause of collapse. Professor Strong disagreed. He considered this volume of loss, against the background of total volume for the patient of 3,550mls and the previous loss of about half that volume to be a sufficient precipitator of collapse. He also noted Dr Fonseka's observation that there "*was a lot of blood coming out from one of the drain sites. From memory it was the right side drain*".[69]

219. Professor Strong emphasized that Ms Cvitic was receiving prophylactic Clexane to prevent deep vein thrombosis and pulmonary embolus. He considered Dr Ward's assertion that the problem could be cardiac or pulmonary embolus as denying the obvious. His view was:

> "*The introduction of Heparin at this time was probably the most deleterious decision and event and was further exacerbated by the refusal to reverse the Heparin with Protamine when requested by Dr Carmody."*[70]

220. In relation to the site of bleeding Professor Strong considered Dr Carmody's recollection was the most informative. He referred to Dr Carmody saying on drawing back the drapes:

> "*I note blood freely flowing from the cutaneous puncture from the drain inferior to the skin crease.….Application of a skin retractor revealed there was bleeding from the external iliac vein:……Using 4/0 prolene, I placed a continuous suture across the front wall of the vein and this stopped the local bleeding."*[71]

221. Professor Strong's interpretation was based on his acceptance that the exit wound was below the skin crease, which meant the drain was passed behind the inguinal ligament. He said the external iliac vessels pass behind the inguinal ligament and pushing a trochar at this site makes penetration or damage to these vessels a high possibility. Professor Strong dismissed suggestions that damage could have been caused by diathermy or adhesions or a smaller vein being injured and tamponaded and then released by the removal of the drain. These were not in accordance with the precise observations made by Dr Carmody.

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[69] Exhibit B 48, Paragraph 12
[70] Exhibit C304 , page 3
[71] Exhibit C304, at page 3 - quoting from Dr Carmody.

222. Professor Strong also disagreed with Associate Professor Jobling's view that the theory of tamponade (of the external iliac vein) was not tenable because there would have been torrential bleeding at the time which would not have been stopped by tamponade. Professor Strong responded that this was incorrect because a drain could tamponade a lacerated or transfixed drain in his view. He supported this view with the fact that a large vein like the iliac vein has high volume but low pressure flow. Thus tamponade is not uncommon. He had observed a (much larger) inferior vena cava tamponaded in the retroperitoneal space with minimal bleeding until the space opened and torrential haemorrhage ensued.

223. His considered view was that the information indicated the collapse on 14 February was due to haemorrhage from the external iliac vein. He stated the haemorrhage was due to the release of the tamponade effect when the drain was dislodged but would also have occurred at the time of removal, which was planned that morning. He was not certain that the degree of collapse would have occurred without the patient being dehydrated and with less than half level of haemoglobin from previous losses.

224. He considered the immediate treatment by staff who resuscitated Ms Cvitic and took her to theatre to be excellent. Finally, Professor Strong criticised the failure by Dr Ward to recognise blood loss was the primary problem. The direction to Heparinise the patient was, in his words, "*the most fateful decision and was aggravated by the refusal to reverse the Heparin with Protamine when all the evidence and expertise demonstrated that a pulmonary embolus had not occurred.*"[72]

225. Mr Robert Rome is a Victorian gynaecological oncologist who was requested by the Surgical College of Gynaecologists to review Dr Ward's case notes for Ms Cvitic and others.[73] Statistically, based on the number of radical pelvic operations that Dr Ward conducted, Mr Rome concluded his complication rate requiring a return to surgery was low. Mr Rome also expressed the view that he considered interstate review would have been preferable.

226. Mr Rome considered it was not exactly clear where the site of the major bleeding was located and when it started. He disagreed with Professor Strong that the external iliac vein was lacerated by the trochar during the insertion of the Blake drain during the first operation on 11 February 2002. His reason for so doing was that he said there would have been torrential bleeding at the time which would not have been stopped by tamponade. The finding of 1.5 litres of haemoserous fluid and old blood he thought would not be uncommon 3 days post radical surgery.

227. Mr Rome considered it much more likely that either the external iliac vein or its inferior epigastric tributary was lacerated and the bleeding

[72] Exhibit C304, page 4.
[73] Exhibits A36(CV), C180 (report)

commenced when the drain was dislodged and fell out on 14 February 2002. He has witnessed cases where bleeding has commenced immediately after the removal of a drain tube.

228. He also disagreed with Professor Crandon's contention that the drain was negligently inserted exiting below the groin crease. He said this position was well below the inguinal ligament and he considered it "*nigh on impossible to insert a drain tube in this way*" [74]

229. However he did agree with others that the dose of prophylactic Clexane of 40mg was a large dose. He said: "*The addition of a full anti-coagulating dose of Heparin in someone who was already bleeding was very dangerous and bordering on negligent practice*."[75]

230. Mr Rome assumed this was a mutually agreed decision with the specialist anaesthetist and both should "*take responsibility for what proved to be a disastrous decision*".

231. Mr Rome concluded:

> "*I do not believe that Dr Ward's surgery especially his positioning of the drain tube was substandard in any way. The events of the 14 February 2002 were obviously disastrous but the decision to give Heparin on the assumption that Ms Cvitic had a pulmonary embolus was the critical decision that tipped the scales."*[76]

232. He pointed out areas for improvement required to be addressed by the hospital in order to be able to offer a safe delivery of gynaecological oncology services. There needed to be a second specialist appointed to provide back up, support and peer interchange together with designated space and consistent nursing team support.

233. Associate Professor Jobling, from Victoria, was also requested by the Surgical College to review Dr Ward's cases, including that of Ms Cvitic.[77]

234. He noted the operation time was very short and may have been as little as 60 minutes. He referred to the sequence of events and that at the first emergency laparotomy a "*relatively modest amount of blood was identified in the peritoneal cavity and a judgement was made that the cause of the collapse was not easily explained by the finding intra-peritoneally. Accordingly, the patient was treated as if she had suffered a significant pulmonary embolus which could indeed occur after radical pelvic surgery on around day 3.*"[78]

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[74] Exhibit C180, page 5.
[75] Exhibit C180, page 5.
[76] Exhibit C180, page 5.
[77] Exhibits A27 (CV), C181 (report)
[78] Exhibit C181, page 2.

235. Assoc Professor Jobling noted the conjecture that the cause of the bleeding from the external iliac vein may have occurred due to inadvertent placement of the redivac drain tube through the external iliac vein. He thought this "*highly unlikely as it would be almost impossible to place a redivac drain through the external iliac vein without seriously damaging the external iliac artery*."[79] I note it was in fact a Blake's drain.

236. He continued "*It would also seem extremely unlikely to contemplate a tamponade which after inadvertent removal of the drain tube at the time of collapse in the ward, that only 1500mls of serosanguineous fluid would be present*".

237. His conclusion was that the serious bleeding after Heparinisation was due to disseminated intravascular coagulation. He postulated that the use of diathermy at the time of the lymphadenectomy might have compromised the vein.

238. Associate Professor Jobling agreed that Ms Cvitic died due to complications of profound blood loss which he said could be argued to have resulted from inappropriate Heparinisation. He categorised this as an error of judgment rather then negligence. He disagreed strongly with the hypothesis that the venous injury on the pelvis was a direct result of negligent placement of the trochar. Associate Professor Jobling considered it "*more likely that the drain tube had avulsed a branch of the circumflex iliac vessels on its exit through the abdominal wall, which would be the source of the arterial bleed noted after Heparinisation which required exploration of the groin and oversewing*."[80]

239. Referring to the original collapse, Associate Professor Jobling noted the haemoglobin of only 5.3 but thought it may well be due to a vaso vagal episode during the initial procedure. He could not find any evidence of recorded blood loss for the operation.

240. Associate Professor Jobling did comment that the length of time of the operation of 11 February (one hour) was "*extremely short*".[81]

241. Professor Hammond, Director of Gynaecology in King Edward Memorial Hospital in Perth, Western Australia reviewed the material.[82] He started with Dr Ward's explanation of events that the collapse followed the traumatic and unsupervised removal of the right pelvic drain which caused an avulsion to a vessel, close to or involving the right external iliac vein, which led to rapid intraperitoneal haemorrhage and collapse. Nursing notes suggest the patient collapsed and during the collapse and resuscitation the drain was removed.

[79] Exhibit C181, page 3.
[80] Exhibit C181, page 4.
[81] Exhibit C181, page 4.
[82] Exhibit A25 (CV)

242. Professor Hammond would have expected torrential bleeding if a drain went through the external iliac vein and he thought it highly unlikely that a tamponade would occur.

243. He postulated that the damage was to a lesser vein like the inferior epigastric close to the inguinal ligament which he conceded could have been transfixed and delayed haemorrhage occurs**.** He could not reconcile the findings of the first laparotomy on 14 February, where only limited apparent bleeding was visible, with the proposition that the drain had transfixed or damaged the external iliac vein on 11 February. He did however point out that Dr Carmody, who assisted at the second laparotomy stated there was damage to the external iliac vein itself. He did not see how this could be reconciled with the overall clinical picture of the patient and the fact the injury did not become apparent for three days. His opinion was that if it could be demonstrated that the external iliac vein had been punctured by a drainage tube then he would consider it negligent.

244. Professor Hammond referred to the decision to Heparinise the patient as a decision made in conjunction with the anaesthetic colleague and after Dr Ward had not found massive intra-abdominal haemorrhage at the first laparotomy. The hypothesis of a massive "*saddle*" embolus was considered and the decision to administer Heparin followed this. Professor Hammond noted that in retrospect this interpretation was wrong and that the patient developed unstable coagulopathy and increased bleeding which was difficult to control. Professor Hammond considered this to be a judgment error, not an adverse skill issue. The error was made in the context of a life threatening situation presenting as an emergency.[83]

245. Professor Hammond accepted that if the drain had in fact exited below the skin crease at the groin, then it was placed too low and exited below the inguinal ligament in the groin. He could not understand how this could have been done as it would require the drain to pass under or through the inguinal ligament. If this happened, it would be negligent practice. Professor Hammond suggested the skin fold might have been a fold of abdominal skin lying in the right iliac fossa close to the inguinal ligament. I note however Ms Cvitic was described as thin and unlikely to exhibit such a skin fold. He suggested reference to the autopsy report and nursing notes for other information.

246. The autopsy report did not assist. There was one reference to nursing notes indicating ooze from the right leg drain,[84] but contrary evidence from another nurse that the right drain exit was in the lower abdomen.[85] Both nurses were quite inexperienced at the time.

247. Professor Hammond noted it remains the consultant's responsibility to monitor the patient and arrange appropriate investigation in accordance

[83] Exhibit C99(J), page 3.
[84] Page 185, Nurse Smith, line 52
[85] Page 182, Nurse Schluter, lines 55-60

with the patient's condition. He understood the position to be that the patient was doing very well and with the inference there was no need to call for haemoglobin testing.

248. Dr Theile is a Professor of surgery and reviewed Ms Cvitic's notes and subsequent reports.[86] With the advantage of hindsight he considered the problem on 14 February was always one of bleeding and that there was no evidence of pulmonary embolus, air embolus or cardiac tamponade. He criticised Dr Ward's adherence to the possibility of pulmonary embolus and indicated this had led to incorrect and damaging decisions, including the administration of Heparin. He agreed with the conclusions reached by some of the other reviewers that there was evidence of damage to the external iliac vein and that this must have occurred via the trochar at the time the Blake's drain was inserted. He interpreted the information as consistent with the trochar going beneath the inguinal ligament causing damage to the vein and possibly also the artery which subsequently developed arterio venous fistula. He considered the ligament could affect a tamponade which might be released intermittently when the patient was mobilised at various times, until the final episode when the drain was dislodged. This could account for the declining haemoglobin from the pre-operative state, although he considered Ms Cvitic was probably anaemic at the outset given her history. He also commented on the brief operation time, without drawing any necessary conclusions from this information alone.

249. Dr Theile commented that fluid loss needed to be accurately documented and that haemoglobin estimates were essential given the nature of the operation. He also remarked that operation notes did not accurately reflect the level of blood loss in the procedures on 14 February given the information that 18 units of blood and blood products were given in the course of the operations on that day.

250. He considered the profound coagulopathy that Ms Cvitic suffered was due to profound blood loss. He was quite emphatic in his opinion that in all the circumstances Heparin should not have been given and if it was, that it should have been reversed by Protamine.

Responses by Doctors Ward and Carmody to expert opinion

251. Dr Carmody distinguished the particular Blake's drain from a redivac drain (referred to by Professor Jobling) which has perforations and uses higher vacuum pressure. Dr Carmody noted that the drain can be placed variously within the abdominal area, but generally so that the trochar exits either through the surgical incision itself or from one to two inches below that transverse line.[87] If the trochar passed through or below the inguinal ligament, as postulated by Dr Carmody, then it is very close to particularly susceptible anatomical features. Mr Rome considered it impossible to

[86] Exhibit C281 (report)
[87] Page 100, line 1-20

have employed the trochar beneath the inguinal ligament to exit below the Holden's line, the crease in the groin. Dr Carmody disagreed and demonstrated to the court how he thought it could happen.

252. Dr Ward disagreed with Dr Thiele's interpretation of what had happened. He said it was physically impossible for the drain to have travelled in the manner suggested by Dr Thiele.[88] Dr Ward also disagreed with the interpretation of Dr Strong saying the trochar could not move in the suggested way.

253. Dr Ward's explanation was that the drain had exited through the abdominal wall. He agreed that at the time of collapse it was likely that it was blood loss that had precipitated the event and took her to theatre. Dr Ward still could not really understand why Ms Cvitic collapsed on 14 February. He considered there was blood not accounted for. He conceded that only a breach of the vascular system could explain the collapse. Dr Ward said generalised "*ooze*" from cut surfaces could have caused such a loss over three days.

Demonstration of Dr Ward's drain insertion in presence of Drs Thiele and Strong

254. Witnesses were recalled so that Dr Ward could demonstrate why he considered it impossible to insert the trochar in such a manner to travel under the inguinal ligament, damage the external iliac vein and exit below Holden's line in the position asserted to be the exit point by Dr Carmody. Drs Strong and Thiele observed and listened to Dr Ward and then responded.

255. Dr Ward's rejection of Dr Carmody's conclusion was based on the physical dimensions of the female pelvis and the length of the trochar. He contended it could not be manipulated in the manner suggested. He said the angle of entry was dictated by the suggested position of the defect in the remaining peritoneum.

256. Dr Thiele responded that the structures are in fact capable of being moved as insertion of the drain occurs, which can be via quite a vigorous motion. He demonstrated how he considered the iliac vessel could have been damaged (and putatively tamponade by the drain) before exiting high in the thigh. Going beneath the inguinal ligament was the mechanism by which the tamponade had occurred because the drain was compressed into the vessel by the inguinal ligament.

257. Dr Strong considered the demonstration and responded with a demonstration that a longitudinal arc like sweep down under the inguinal ligament could be executed to exit at the nominated point. Dr Strong had not witnessed where there was a defect in the peritoneum (thought by Dr Carmody to be a defect caused by the trochar). Dr Strong postulated that

[88] Page 918, line 46

the peritoneum would have been breached in the course of the operative procedure itself rather than subsequent insertion of the drain.

Where did the right drain exit?

258. Dr Carmody concludes the wound he saw in the upper right thigh, below Holden's line was the exit wound from the drain. He draws this conclusion from the fact that he was exploring the apparent source of bleeding from a defect in the peritoneum in the lower right area of the abdomen. He then discovered and observed damage to the external iliac vein which was bleeding. On drawing back the surgical drapes he saw blood also coming away from a wound in line with these two observations. The wound was below Holden's line, the groin crease. He could not otherwise explain the puncture site. He concluded it was the exit point for the right drain.

259. Dr Ward denied the drain exited at this point saying it was impossible to insert the drain in this way. He said the drain had exited in the normal fashion through the side abdominal wall. He acknowledged that he saw blood issuing from the drain hole on 14 February, but not at the location asserted by Dr Carmody. He acknowledged that Dr Carmody stopped the blood flow by oversewing a vein which could have been the external iliac vein, or epigastric vein or aberrant vascular vessels.

260. Dr Elmes, who assisted at the original surgery, did not make any observation to indicate she noticed anything out of the ordinary, which she said was to place the drains internally, exiting the abdominal wall. She did not however have any specific memory of insertion or placement of the drain.

261. Nurse Nicole Smithe was a recently graduated nurse. Her statement [89] refers to her contemporaneous note in the records of 13 February that the patient "*had blood ooze from right leg drain*". By the time she gave a statement she could no longer recall the situation but she was quite clear that she would not have described blood ooze from the right leg drain if the drain had exited from the abdomen. At the inquest she no longer had any recall of the observation.

262. The opinions of expert surgical reviewers varied as to whether or not it was possible that the drain could have travelled this path. It was common ground that if the trochar had travelled this path it was unacceptable surgical practice and highly likely to have caused damage to susceptible vessels in the region.

Theory of tamponade

[89] Exhibit C302

263. If the drain in fact caused the damage discovered and it was to the external iliac vein, there was variable expert opinion on whether it was possible that the drain tube itself, in the context of close proximity to the inguinal ligament and supporting tissue, could cause a tamponade or variable tamponade effect. Some expert opinion considered it impossible, others had experience of other large volume veins being tamponaded by surrounding tissue until such time as the pressure was released. The Blake's drain was less likely than some other drains to cause avulsion upon removal.

Alternative explanations of damage caused to external iliac vein (or nearby vascular structure)

264. It was suggested that the uncontrolled removal of the drain at about 9.30am on the morning of 14 February 2002 might have avulsed the vein and been the starting point for bleeding. It is hard to reconcile this with observations of "*old blood*" discovered by Drs Ward and Allison at the first laparotomy.

265. Alternatively, it was suggested that Dr Carmody's efforts to discover the source of bleeding caused the damage to the vein by use of the diathermy tool. This suggestion is not tenable given the earlier laparotomy when one to 1.5 litres of "*old blood*" was discovered.

Summary of evidence

266. Nardia Cvitic was a small slight woman who required radical surgery to address a serious illness which, if left untreated would be fatal. She was suffering from cervical carcinoma and required a radical hysterectomy. She was a thirty year old mother of two young children.

267. Dr Bruce Ward undertook the necessary surgical procedure on 11 February 2002.

268. Ms Cvitic had a low haemoglobin reading of 113 before the initial surgery. The normal range is between 115-165 g/L. She also had a previous episode of post operative bleeding requiring transfusion.

269. The first procedure by Dr Ward achieved its major goal of effective removal of organs and tissue to address the underlying disease problem.

270. The procedure was performed in a very short time frame of one hour given its complexity, such that it was noteworthy and raised questions and even some unease to other reviewing surgeons.

271. Dr Elmes was the registrar in gynaecology who assisted at the initial operation. She considered the operation to be uneventful and did not recall anything unusual about the placement of drains at the time.

272. Blood loss at this first operation was not accurately recorded but estimated between 600ml and 1 litre.

273. In the post operative period before Ms Cvitic's collapse on 14 February further loss was documented indicating a higher loss from the right drain. The documentation was incomplete.

274. Dr Elmes did not order post surgical blood testing due to the direction of Dr Ward not to do so unless he indicated to the contrary. I accept the evidence of Dr Elmes, as supported by Dr Fonseka, on this issue.

275. Ms Cvitic had some nausea, vomiting and reduced fluid intake and reduced urine output in the three days post operative and prior to her collapse on 14 February 2002. Dr Ward reviewed her on the first post operative day and then did not see her until after her collapse on 14 February.

276. On 14 February 2002, Ms Cvitic complained of severe lower right abdominal pain and then suddenly collapsed. It was noticed that there was blood from the right drain site at the time of her collapse. She had been reviewed by Dr Elmes shortly before this occurred and nothing untoward had been observed. In the immediate response to this collapse the right drain became dislodged. Some further blood loss was noticed.

277. Blood was collected at 11.10am immediately after her collapse. The results showed her haemoglobin was 81g/L. This did not reflect any sudden bleeding at the time the drain became dislodged but reflected her haemoglobin level at the time of collapse immediately before the drain was dislodged. It revealed that her haemoglobin had dropped from 113g/L prior to surgery on 11 February to 81g/L, which was indicative of bleeding after the initial surgery.

278. Ms Cvitic had lost approximately half her blood volume in the post operative period up to the time of the collapse.

279. Subsequent haemoglobin test results from samples taken at 12.44 and 13.40 hrs on 14 February continued to drop to a low of 55g/L before increasing to 95g/L at 14.15 and 110g/L at 14.50.

280. Dr Elmes attended on Ms Cvitic after her collapse and noted bluish discoloration and abdominal distension indicative of internal bleeding. This information was provided to Dr Ward. Appropriate resuscitation measures were instituted and Ms Cvitic was taken to theatre in a prompt fashion. Dr Ward was contacted urgently and was able to attend immediately. Dr Ward examined Ms Cvitic and assumed there was a bleeding problem although he thought this to be unlikely.

281. Dr Allison assisted Dr Ward at the emergency laparotomy which commenced at 11.00am. Between 1 and 1.5 litres of red tinged fluid described as "*old blood*" was observed when the abdomen was opened. A

midline vertical incision was made which stopped short of the transverse incision line made in the initial operation on 11 February. There was no readily discernible discreet site of bleeding. Dr Ward did not consider these findings to be sufficient explanation of the sudden collapse and the continuing acute condition of Ms Cvitic. He therefore considered other explanations, primarily the existence of a pulmonary embolus, as the cause of collapse.

282. Pulmonary embolus was a possibility in a post surgical phase after major surgery, but unlikely given the substantial prophylactic dose of Clexane at significant levels, together with the fact that Ms Cvitic was a lightweight, young and otherwise healthy woman who smoked which I understand from the evidence reduces the risk of pulmonary embolus.

283. Cardiac tamponade was also considered as an alternative diagnosis and Dr Ward passed a needle into the pericardiac sac to relieve any fluid, but without result.

284. Dr Ward verbally voiced his process of thinking in reaching the conclusion that the problem must therefore be pulmonary embolus. He was the treating surgeon with intimate knowledge of his patient. No-one in the anaesthetic or intensive care team that supported the operation had this knowledge of the patient. No-one expressed a contrary view to Dr Ward's conclusion or direction to administer 10,000 units of Heparin. This is double the usual dose, which would have a more prolonged effect in time. The Heparin would not "*treat*" the supposed embolus, but would prevent the formation of another potentially fatal embolus. The Heparin was administered at or about 11.30am to 11.40am.

285. Dr Ward concluded the first emergency procedure by inserting one or two packs in the lower right section of the abdomen to absorb blood ooze in this area. He left the sterile area and wrote up on the computer his operation notes including the instruction to send the patient to intensive care for further management. There was no direction for CT scan to confirm the presence of embolus. No-one in theatre recalled Dr Ward voicing this to be the plan.

286. There was significant concern in the operating theatre throughout the procedure. Dr Ward was stressed and concerned with the patient's continuing serious condition.

287. Other people in theatre were also concerned and took the initiative to seek expert opinion and assistance. Arrangements were made for a diagnostic transoesophageal echocardiogram (TOE) to confirm the suspected pulmonary embolus. Dr Jennifer Cooke who is a cardiologist attended from just prior to midday until 1.00pm. She demonstrated there was no embolus present. That result was available and known by midday. There was however some failure of the heart to adequately fill the right ventricle which then became the focus of investigation.

288. Cardiac surgeon Dr Julie Mundy attended urgently to explore the possibility of cardiac tamponade. She agreed with Dr Cooke that pulmonary embolus was not occurring because an empty or collapsed right ventricle was inconsistent with a pulmonary embolus. With pulmonary embolus, the right ventricle would be dilated not compressed because there would be an obstruction to the outflow of the right ventricle. There would be a very high blood pressure between the right side of the heart and the lungs causing the right side of the heart to expand.

289. Dr Mundy instructed the general surgeon (Dr Allison) to urgently perform a pericardial window procedure prior to her arrival. Dr Mundy was not told that Dr Ward had already performed an attempted aspiration into the pericardiac space using a needle. She was not informed that the patient was hypovolemic or that her haemoglobin was low.

290. Dr Mundy observed on her arrival "*blood everywhere*" and the patient was packed with laparotomy sponges. She observed blood in the suction bottles and on the drapes. The packs in the pelvis were blood soaked with blood rising around them. Dr Mundy confirmed what Dr Allison had already ascertained, that there was no tamponade. She informed Dr Ward of this finding and that she considered the problem to be one of bleeding. Dr Ward said there was only 500-800ml of blood in the abdomen when he originally opened. He maintained the contention of pulmonary embolus and was reluctant to consider blood loss as causing the problem.

291. Dr Mundy instructed the anaesthetist to give the patient more blood and to try to make up blood volume. She and Dr Cooke left by 1.00pm. Dr Carmody, a general surgeon, had also been contacted to assist in theatre. He arrived before the departure of the cardiologist and cardiac surgeon. He took over from Dr Allison who was assisting Dr Ward. By about 1.00pm he assessed the situation and concluded that there was an unresolved bleeding problem. It was Dr Carmody who ordered Protamine to reverse the effects of Heparin. This was given between 1.05 and 1.15pm.

292. Dr Carmody asked Dr Ward to swap sides with him and from that point Dr Carmody led the surgery. He observed the greatest amount of blood appeared to be issuing from the lower right quadrant of the abdomen. He opened the original transverse surgical incision. He discovered a defect in the remnant of the peritoneum with fresh blood issuing from it. On moving the surgical drapes down to expose more of the area, he observed a puncture wound about two centimetres below the crease in the groin where the leg meets the abdomen. This is known as Holden's line. Fresh blood of the same colour was issuing from this puncture wound. He observed the wound to have a slightly 'V' shape. He considered the source of the bleeding must be from damage to a vein between these two points. The blood was non pulsatile. He explored between the two points with a dissecting diathermy tool. He dissected through the round ligament and down towards, but not through the inguinal ligament. A tear in a vein was discovered. Dr Carmody clearly identified the vein to be the external iliac vein next to the artery of the same name. He refuted the possibility that he

had mistaken the vessel for a smaller epigastric vessel or aberrant venous pool or circumflex vein. The flow from these much smaller vessels would not be consistent with the blood flow that was evident.

293. His first attempt to oversew the defect was unsuccessful. Different suture material was obtained and he succeeded in closing the breach in the vein and haemostasis was achieved.

294. Dr Ward agreed he saw fresh blood issuing from the drain exit wound but he disagreed that the exit point was below the groin crease (Holden's line). Dr Ward oversewed the vena cava common iliac vein where he had assisted in inserting an access line earlier during surgery. He agreed that this was not the source of bleeding that Ms Cvitic was suffering. He also placed a stent in a compromised (but not bleeding) vessel before Ms Cvitic was closed and transferred to intensive care.

295. Dr Mundy was recalled to the Mater Hospital later that night and again on 15 February. On both occasions she checked and demonstrated that there was no bleeding problem emanating from the heart or chest or lungs but that the patient was coagulopathic from all raw surfaces.

296. The evidence was that despite all efforts Ms Cvitic's condition continued to decline. She developed cerebral oedema and progressive organ failure. She died on 22 February 2002.

Findings pursuant to section 43 *Coroners Act 1958*

297. On 22 February 2002, Nardia Annette Cvitic died in the Mater Hospital at Brisbane. On 11 February 2002 she had undergone a radical hysterectomy and associated surgical procedures due to cancer of the cervix. On 14 February 2002 her condition suddenly declined after the recent removal of drains inserted during surgery. Intra-abdominal bleeding was suspected and she was operated upon on a number of occasions on 14 February and up to the time of her death. Her condition declined and she developed cerebral oedema and multiple organ failure.

298. The cause of death was multi-organ failure due to multiple transfusions required for post operative bleeding due to bleeding disorder. Adenocarcinoma of the cervix and coronary atherosclerosis were underlying conditions which contributed to the cause of death.

Consideration of section 41 *Coroners Act 1958* regarding committal for trial for criminal negligence

299. The coroner is required to consider whether there is *prima facie* case of manslaughter based on criminal negligence upon which a properly instructed jury could return a verdict of guilty.

300. The word "*negligence*" has been used by various expert medical commentators in the context of reviewing Ms Cvitic's treatment. Such

references or opinions are not determinative of whether or not a *prima facie* case of criminal negligence has been established. The findings of this inquest, which is conducted according to the *Coroners Act 1958*, may not be framed in such a way as to appear to determine any question of civil liability or as to suggest that any particular person is found guilty of any indictable or simple offence. [90]

301. The evidence at the inquest raised the following questions about the standard of care and skill exercised by Dr Bruce Ward :

(a) The placement and exit point of the Blake's drain at the end of the initial operation on 11 February 2002;
(b) Whether the passage of the trochar used to insert the right hand drain damaged the external iliac vein or some other vessel;
(c) Whether damage to the vessel was the cause of the bleeding;
(d) Whether that bleeding led to Ms Cvitic's collapse on 14 February 2002;
(e) Whether loss of blood was the critical factor leading to Ms Cvitic's death;
(f) The issue of post operative tests and monitoring of the patient between 11 and 14 February 2002;
(g) The decision making and actions taken by Dr Ward on 14 February 2002 after the collapse of the patient;
(h) The conclusion reached by Dr Ward that it was not a problem of bleeding as the critical condition to be treated on 14 February 2002;
(i) The misdiagnosis of pulmonary embolus;
(j) The administration of 10,000 units of Heparin when the pulmonary embolus had not been empirically demonstrated;
(k) The adherence to the diagnosis of pulmonary embolus after independent expert assessment and advice to the contrary;
(l) The delay before Protamine was administered to reverse the effects of Heparin; and
(m) The delay in discovering the source of bleeding;

302. There is evidence that the decisions made and the actions taken or not taken on each of these issues were the primary responsibility of Dr Ward. There is sufficient relevant evidence on each of these issues on the basis of which a properly instructed jury could convict Dr Ward of unlawfully causing Ms Cvitic's death.

303. These are matters for consideration of the criminal jurisdiction and fall within the purview of Section 288 of the Criminal Code Act 1889 (Qld) which imposes a duty on every person administering surgical or medical treatment to have reasonable skill and use reasonable care in doing such acts. Criminal responsibility arises and a person is held to have caused any consequences which result to the life or health of any person by reason of any omission to observe or perform that duty.

[90] Section 43 (6) *Coroners Act 1958*

304. I have had regard to the case of *R v Bateman*[91] where Hewart LCJ said:

> "*In explaining to juries the test which they should apply to determine whether the negligence in the particular case amounted or did not amount to a crime, judges have used many epithets, such as "culpable", "criminal", "gross", "wicked", "clear", "complete." But, whatever epithet be used, and whether an epithet be used or not, in order to establish criminal liability the facts must be such that, in the opinion of the jury, the negligence of the accused went beyond a mere matter of compensation between subjects and showed such disregard for the life and safety of others as to amount to a crime against the State and conduct deserving punishment…It is desirable that, as far as possible, the explanation of criminal negligence to a jury should not be a mere question of epithets. It is in a sense a question of degree and it is for the jury to draw the line, but there is a difference in kind between the negligence which gives a right to compensation and the negligence which is a crime."*

305. I am satisfied there is evidence of sufficient reliability on each of the identified matters. I am further satisfied that a properly instructed jury could make a finding of guilt based on criminal negligence against Dr Bruce Ward for causing the death of Nardia Annette Cvitic.

306. Bruce Gordon Ward you are charged that between 11 day of February 2002 and 22 day of February 2002 at Brisbane in the State of Queensland you unlawfully killed Nardia Annette Cvitic.

307. You are hereby committed to the next sittings of the Supreme Court held at Brisbane.

308. Bail is granted on your own undertaking. You are required to wait to sign necessary documentation before you are able to leave.

Comments by way of rider section 43 (5A) *Coroners Act 1958*

309. There is not much gained by the public process of an inquest unless there has been consideration of improvements for the future which aims to reduce the likelihood of another death occurring in similar circumstances. A coroner's inquest has the benefit of hindsight with which to review events. At the time that Ms Cvitic collapsed there was little warning to indicate the seriousness of the emergency situation. I have no hesitation in

[91] [1925] 19 Cr App R 8

recording that all concerned were attempting to the best of their abilities to save Ms Cvitic's life.

310. With hindsight, I remark and echo the comments of experts who lamented the absence of assiduous record keeping of loss of blood and fluid balancing from the time of the very first procedure, post operatively and then during the subsequent procedures. If this had been recorded and coupled with so called standard blood tests, including haemoglobin levels, the problem of blood loss might have been identified earlier.

311. It is a matter for the review of the relevant colleges of surgery and hospitals whether there should be any more directive protocols to monitor a patient's condition after major surgery.

312. After Ms Cvitic's death the Mater immediately took action to review the circumstances surrounding her death and consider what action should be taken. I will detail the responses that have been made by the Mater since Ms Cvitic's death.

313. Exhibit C317, is a statement of Dr Geoffrey Hirst, Senior Risk Management Consultant, Clinical Safety and Quality Unit, Director of Division of Surgical Services for Mater Health Services. After Ms Cvitic's death, Dr David Theile was retained to review her case and provide a report and advice. Dr Theile concluded with suggestions for improvements. Dr Theile's recommendations have been acted upon by the Mater as set out in Dr Hirst's statement.

314. Dr Thiele's first two recommendations were related directly to Dr Bruce Ward. An audit to determine whether there were other problems with operative technique was proposed together with discussions about safe placement of abdominal drains. The Mater in fact took steps to de-credential Dr Ward as a specialist operating at the Mater. The Medical Board has also considered a number of Dr Ward's cases and I make no further comment about this.

315. The third proposal for change was to review the understanding of "*Emergency Surgeon of the Day*."

316. Dr Theile's last suggestion was that pathologists performing post mortems have their attention drawn to specific clinical features that may need verification or elucidation. He referred to this case where an arteriovenous fistula between the external iliac vessels was highly suspected as a result of clinical and ultrasonographic findings. He remarked he found it somewhat surprising that the pathologist's only comment with respect to this diagnosis is that "*the great veins appeared unremarkable".*

317. The Mater Hospital surgeons considered Dr Theile's suggestions.[92] In relation to coronial autopsies they raised the lack of interaction and input from the treating team informing the autopsy process and the relay of information back to the clinicians. While I acknowledge that historically this may have been the case, including at the time of Ms Cvitic's death, the *Coroners Act 2003* which came into effect from 1 December 2003 has aimed to change that process. Complete medical records are routinely available to the pathologist prior to the autopsy. On request of an interested clinician the coroner has authority to authorise the presence at autopsy of a person with a sufficient interest.[93] There is certainly scope for clinicians to involve themselves in this process which can be initiated by request to the coroner. There is also specific power to provide relevant information prior to autopsy.

318. Since December 2003 much greater communication occurs on a daily basis between clinicians, pathologists and coroners from the time (and even in advance) of a reportable death. Hospitals routinely request and are provided with copies of coronial autopsy reports. Individual doctors and families can request and receive autopsy reports. I acknowledge there is always scope to improve communication and awareness between the various interested parties.

319. An external review of gynaecological cancer services was invited by the Mater Hospital. Professor Neville Hacker undertook the review of the services at both the Mater Hospital and the Royal Brisbane and Women's Hospital. He delivered his report in August 2004. The Mater Hospital has addressed those recommendations although the full time director of gynaecological oncology position had not been able to be filled at the time the report was written. A broader cooperative service operating between both hospitals appears to offer a more comprehensive service as a result of this review. Greater support of complimentary services and shared training and resources to some extent is hoped to strengthen the overall service and safety to patients.

320. In 2003 Mater Heath Services also developed their Clinical Safety and Quality Unit. A web based incident reporting system informs the unit and appropriate follow up is then initiated. An education program has also been implemented to raise awareness of the importance of reporting sentinel events as soon as they occur.

321. Significantly, a framework has been introduced to encourage and facilitate a timely, confidential and just process whereby a clinician in any position with Mater Health Services can report concerns which they may have regarding the clinical competence of a senior medical colleague. This is a valuable initiative and is to be commended.

[92] Attachment GH1 to Exhibit C317
[93] Section 21 *Coroners Act 2003*

322. Finally to the family and friends of Nardia Cvitic, I extend condolences on her untimely and traumatic death. It is hoped that the process of the inquest, although emotionally painful in reminding you of your loss, may also have assisted you in understanding what happened and the extensive efforts that were made at the time to save her. Sadly this was not achieved, but it is to be hoped that improvements have been made as a result of her death.

323. Thank you to all the witnesses who have assisted in this inquest and to counsel and the instructing solicitors. It has been a complex and difficult matter where many expert opinions have been provided. In particular, I thank the many medical experts who have provided their time and expertise in reviewing the sequence of events which helped to explain and interpret these events. More importantly it is hoped this effort will have helped general medical knowledge overall by stimulating discussion and raising awareness of the matters discussed in this inquest.

Christine Clements
Deputy State Coroner

29 October 2007