IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2012 1193

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)

Section 67 of the Coroners Act 2008

Deceased:	SALLY ELIZABETH HOPWOOD
Delivered on:	21 December 2017
Delivered at:	Coroners Court of Victoria, 65 Kavanagh Street, Southbank
Hearing date:	22, 23, 24, 25 August 2016
Findings of:	CORONER PETER WHITE
Coroners Officer	Acting Sergeant Andrea Hibbins
Representation	Mr Sean Cash of Counsel appeared on behalf of Dr Barry Chan. Mr Paul Halley of Counsel appeared on behalf of Dr Marcus Loff. Mr Dugald McWilliams of Counsel appeared on behalf of Dr Christopher Goods. Ms Deborah Foy of Counsel appeared for Dr Philip Danby. Mr Tim Hopwood represented the family of Sally Hopwood.
Catchwords	Failure to diagnose aortic aneurysm in a woman with a medical history that included Turner's syndrome with coarctation of the aorta and bicuspid aortic valve.

I, PETER CHARLES WHITE, Coroner, having investigated the death of and having held an inquest in relation to this death at Melbourne on 22, 23, 24 and 25 May 2016 find that the identity of the deceased was SALLY ELIZABETH HOPWOOD, born on 17 March 1955, and that the death occurred on 1 April 2012 at the Chesterfield Ward, Knox Private Hospital.

From: 1(a) Haemothorax following acute thoracic aortic dissection in a woman with congenital heart disease.

In the following circumstances:

BACKGROUND

1. Sally Hopwood (Sally) was 57 years of age with a history of Turners Syndrome, hypertension, coarctation of the aorta, hypothyroidism and mild hypocholesterolemia. [1] She was under specialist care from a cardiologist, Dr Christopher Goods. Dr Goods reviewed Sally in 2005, 2006, 2008, 2010, 2011, and last reviewed her on 23 January 2012, which I now note was two months before her death.[2] At this appointment she had blood tests and a stress echocardiogram performed, all with results within a normal range.

2. On Friday 23 March 2012, Sally was transferred to Knox Private Hospital by ambulance from her home at 9.43pm having developed a sharp pain in the back and later in the left chest and epigastric region and legs, with nausea and vomiting. These symptoms commenced at midday. She left work and returned to her home. During the afternoon Sally tolerated the pain which she later estimated and periods of sweating, eventually calling an ambulance at 8.48pm.

3. At Knox Private Emergency Department (ED) she was assessed by the then senior ED physician Dr Barry Chan.

4. At home Sally's estimate of pain severity was 8/10. Following the administration of nitro-glycerine sublingually and by dermal patch of nitro-glycerine in the ED the severity of her estimate of pain reduced to 3/10.

5. A past history of coarctation of the aorta, hypothyroidism and depression was noted. Further notes in the ED confirmed the above and added that Sally had Turners syndrome, renal colic, a horse shoe kidney syndrome, a known coarctation of the aorta and

[1] See discussion of this condition in the evidence of Professor Jelinek from paragraph 83 below.
[2] See discussion relating to initial error by Dr Goods in respect of the time frame for these events, at transcript 217-18.

hypertension and had been seen regularly by Dr Goods. She had a normal stress echocardiogram two months earlier and had been taking Gopten, Thyroxin and Lexapro.

6. Her vital signs were normal. Mild epigastric tenderness was found on examination, blood tests were ordered as was a portable chest X-ray and electrocardiograms (ECG's). See further discussion of Dr Chans involvement from paragraph 26 below.

7. Sally was admitted to the general cardiology ward at 2.30am Saturday 24 March under the care of Dr Goods, for further investigation. The chest X-ray performed whilst she remained in the ED on Saturday 24 March identified moderate widening of the upper mediastinum with dilation of the upper aorta. The chest X-ray report concluded, ***Given the patients history this may present a long standing feature but if active pathology is suspected a CT would be of use.*** The emphasis is mine.

8. The chest X-ray report was published on 24 March 2012, and was sent to Dr Chan at the ED and copied to the general practitioner, Dr Wong with a hard copy placed on the medical file, which became exhibit 2(f).

9. Dr Goods examined Sally on 24 March 2012, when a systolic murmur was identified. Serial ECG's showed sinus rhythm and fluctuating non-specific anterior T wave inversion. Dr Goods suspected choledocholithiasis and sought a surgical opinion from Dr Michael Bickford.

10. Dr Bickford ordered an abdominal ultrasound of the abdomen, and later a CT cholangiogram. An abdominal ultrasound was performed on 24 March 2012. It concluded that, *there appears to be slight prominence of the intrahepatic ducts and there are small densities distally which are very difficult to image but do raise the possibility of small duct stones. There is a horse shoe kidney with calculi noted on both sides and mild prominence of the right pelvi-calyceal system. This is of uncertain significance as often with a horse shoe kidney the system is slightly prominent. There is also evidence of mild hepatic congestion. If appropriate an MRCP or CT cholangiogram may add further information if the distal pathology is thought to be related to the patients symptoms.*

11. A CT cholangiogram was conducted on Monday 26 March 2012) and showed no evidence of a duct stone or obstruction *on this study.* It further reported, ***mild effusions with segmental collapse and consolidation of both lung bases.*** [3] The emphasis is mine.

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[3] I note here that a CT was in fact the test suggested earlier by Dr Loff, and was later found by Professor Jelinek to have yielded a significant, though misunderstood result. Consultant Cardiologist Professor Jelinek, provided the Court with an expert opinion (see exhibit 2a), and gave testimony in respect of these matters. See further discussion of Professor Jelinek's opinion from paragraph 82 below.

12. Dr Christopher Danby, a physician and nephrologist, agreed with Dr Goods about searching for abdominal pathology. See further discussion of Dr Bickford's and Dr Danby's involvement from paragraph 74 below.

13. Based on this report and the finding of a raised white cell count and raised C-reactive protein (CRP), pneumonia became the working diagnosis. At Dr Goods direction the investigation of Sally's symptoms thereafter became mainly focused on the abdomen and she was treated with intravenous cephalexin, which is a broad spectrum antibiotic.

14. Intermittent pain remained and was described by Sally as located between her shoulder blades and feeling like, lying on a knotted towel, (which I take as a reference to moderate pain). Her pain was thereafter treated by the regular administration of pethidine and paracetamol.

15. In his statement Dr Goods stated that he did not sight the chest X-ray report ordered by Dr Chan. He also stated that an echocardiogram performed in February 2012 was reviewed during her admission to Knox, and showed the presence of normal thoracic aortic dimension and a moderate coarctation. (In fact the last echocardiogram, pre this admission took place on 23 January 2012).

16. See further discussion of Dr Goods testimony as set out from paragraph 45 below.

17. Sally remained in hospital until her death on 1 April 2012, a total of 8 days. During this time no clear cause of her inconsistent pain was identified.

18. On 30 March 2012 Sally had further lower abdominal and back pain, the severity of which was not shown as having been estimated, but was clearly severe with associated nausea.

19. There were plans for her discharge home when she was found unresponsive in the early hours of Saturday 1 April, 2012. CPR was unsuccessful and she was later found to have died from a ruptured aortic dissection with haemothorax.[4]

CORONIAL INVESTIGATION – SOURCES OF EVIDENCE

20. This finding is based on the totality of the material the product of the coronial investigation of Sally's death. That is, the brief of evidence compiled by Coroners Officer Acting Sergeant Andrea Hibbins, the statements, reports and testimony of those witnesses who testified at inquest and any documents tendered through them, and the final submissions of Counsel. All of this material, together with the inquest transcript, will remain on the

[4] Transcript 3-5.

coronial file.[5] In writing this finding I do not purport to summarise all the material and evidence, but will refer to it only in such detail as is warranted by its forensic significance and in the interests of narrative clarity.

PURPOSE OF A CORONIAL INVESTIGATION

21. The purpose of a coronial investigation of a reportable death is to ascertain, if possible, the identity of the deceased person, the cause of death and the circumstances in which death occurred.[6] The cause of death refers to the medical cause of death, incorporating where possible the mode or mechanism of death. For coronial purposes, the circumstances in which death occurred refers to the context or background and surrounding circumstances, but is confined to those circumstances sufficiently proximate and causally relevant to the death, and not merely all circumstances which might form part of a narrative culminating in death.[7]

22. The broader purpose of any coronial investigation is to contribute to the reduction of the number of preventable deaths through the findings of the investigation and the making of recommendations by coroners, generally referred to as the prevention role.[8] Coroners are also empowered to report to the Attorney-General in relation to a death; to comment on any matter connected with the death they have investigated including matters of public health or safety and the administration of justice; and to make recommendations to any Minister or public statutory authority on any matter connected with the death, including public health or safety or the administration of justice.[9] These are effectively the vehicles by which the prevention role may be advanced.[10] It is important to stress that coroners are not empowered to determine the civil or criminal liability arising from the investigation of a reportable death, and are specifically prohibited from including in a finding or comment any statement that a person is, or maybe, guilty of an offence.[11]

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[5] From the commencement of the Coroners Act 2008, (the Act), that is 1 November 2009, access to documents held by the Coroners Court of Victoria is governed by section 115 of the Act.
[6] Section 67(1) of the *Coroners Act 2008*. All references which follow are to the provisions of this Act, unless otherwise stipulated.
[7] This is the effect of the authorities – see for example *Harmsworth v The State Coroner* [1989] VR 989; *Clancy* v *West* (Unreported 17/08/1994, Supreme Court of Victoria, Harper J.)
[8] The 'prevention' role is now explicitly articulated in the Preamble and purposes of the Act. See also the *Coroners Act 1985* where this role was generally accepted as 'implicit'.
[9] See sections 72(1), 67(3) and 72(2) regarding reports, comments and recommendations respectively.
[10] See also sections 73(1) and 72(5) which requires publication of coronial findings, comments and recommendations and responses respectively; section 72(3) and (4) which oblige the recipient of a coronial recommendation to respond within three months, specifying a statement of action which has or will be taken in relation to the recommendation.
[11] Section 69(1).

FINDINGS AS TO UNCONTENTIOUS MATTERS

23. In relation to Sally's death, most of the matters I am required to ascertain if possible, were not contentious. Sally's identity and the date and place of death were not at issue. I find, as a matter of formality that Sally Elizabeth Hopwood, born on 17 September March 1955, late of, Victoria, died at Knox Private Hospital on 1 April 2012 aged 57 years.

24. Nor was the cause of Sally's death contentious. Forensic Pathology Registrar Dr Sameera A Gunawardena, acting under the supervision of Forensic Pathologist Dr Sarah Parsons of the Victorian Institute of Forensic Medicine, reviewed the circumstance of the death as reported by the police to the Coroner, available medical records, photographs of the scene, and post-mortem computerised tomography scans [PMCT] of the whole body, and performed an autopsy.

25. In accordance with Dr Gunawardena's advice, and in the absence of dispute I find that Sally Hopwood died of haemothorax following acute thoracic aortic dissection in a woman with congenital heart disease.

FOCUS OF THE CORONIAL INVESTIGATION AND INQUEST

26. The coronial investigation and inquest into Sally's death was primarily concerned with the circumstances in which she died. Sally had several contacts with Health clinicians in the days prior to her death. She first presented to Knox Private Hospital ED on the 23 March 2012.

27. The adequacy of the clinical management provided by the Knox Hospital Emergency Department and Coronary Care Unit between 23 March and her death 7 days later was the focus of my investigation and the inquest into Sally's death.

Dr Barry Chan ED Physician, Knox Private Hospital

28. As set out from paragraph 2 above, on the evening of Friday 23 March 2012 Sally was bought from home into Knox Private Hospital having earlier experienced the sudden onset of sharp pain in her back and legs with associated nausea and vomiting. Her pain subsequently developed into discomfort in her lower central chest and epigastric region, and persisted through the afternoon with intermittent sweaty periods. The ambulance

officers noted that she had a pre-existing aorta problem and assessed her as experiencing, *principally a gastro intestinal problem with secondary, acute coronary syndrome.*[12]

29. On arrival Sally was triaged as a category 3 with the triage nurse recording Sally's past history of inter alia, *coarctation aorta.*[13]

30. Within 15 minutes at 9.50 pm she was seen by Dr Chan the then Director of the ED, who later noted his findings in his clinical notes.[14] These included that her presenting complaint was the development of severe chest pain, which had come persistent from approximately 3 pm and had been associated with nausea, vomiting and epigastric pain. On his examination Sally's vital signs were seen to be normal with a heart rate of 65, a respiratory rate of 16 and her blood pressure was 116/61.

31. Dr Chan's admitting diagnosis was, *chest pain for investigation.*[15]

32. Dr Chan arranged for a series of investigations to be carried out which included an ECG and a (portable) chest X-ray. In the request for the X-ray Dr Chan noted that Sally had *left chest pain which was for investigation*, and that there had been a past history of coarctation of the aorta.[16] He also noted, *a few bibasal crackles meaning a little bit noisy on chest examination,* and did not seek an urgent report, but simply asked for the X-ray to be performed because a qualified emergency physician, *should be able to interpret the X- ray without the plain X- ray report available.*[17]

33. Dr Chan prescribed intravenous morphine for analgesia and arranged for Sally to be admitted to the coronary care unit under the care of Dr Goods. Dr Chan further stated that he rang Dr Goods to inform him of this matter. He additionally testified that his recollection of the telephone conversation was not particularly good but believes he would have told Dr Goods about the chest X-ray and his interpretation of it, *as this was his usual practise.* [18]

34. (Dr Goods later testimony was that he did not hear from Dr Chan on this matter and would have expected to have done so if there was a concern about the X-ray).

35. According to Dr Chan the X-ray was performed late in the evening of Friday 23 March 2012 and he viewed the X-ray, before his shift finished at mid-night. *I did not record the findings in the ED record. I believe I noted there was a widening of the mediastinum and*

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[12] Exhibit 8 page 76.
[13] Ibid page 82.
[14] Ibid page 86.
[15] Statement at exhibit 8, and clinical notes at exhibit 8, pages 86 and 87.
[16] See exhibit 2(d).
[17] Transcript 70.
[18] Transcript 91.

interpreted it as a long standing radiological feature...I did not consider aortic dissection as a potential diagnosis based upon her history and clinical presentation.[19]

36. Dr Chan further observed that the widening of the mediastinum was, *obvious.* [20] And that under the current policy investigation guidelines, (authored by himself while head of the ED), that where the results of any testing are abnormal, that those results will be, correlated with the patients file to ensure appropriate management.

37. Dr Chan additionally testified that he did not see Sally again after the completion of his shift. His plan was to transfer Sally to the Critical Care Unit (CCU), to monitor and perform serial troponin results and for Dr Goods to review her the following day.

38. Dr Chan was further questioned about the nursing entry on 25 March 2012 referring to the chest X-ray results, made after Sally's referral to the CCU from the ED on the night of 23 March, which inclusion supported Dr Chan in his belief that the X-ray examination report had reached the ward.[21]

39. Dr Chan also testified to the fact of the posting of the X-ray and the subsequent X-ray report on line, and to the availability of that material at terminals throughout the hospital.

40. Dr Chan was further questioned by Mr McWilliams, Counsel for Dr Goods, on his evidence that a hard copy X-ray report would be delivered from the ED to the ward to be included in the patients history. In response Dr Chan explained that if the patient remains in the hospital, *we will send the report or the abnormal report or normal/abnormal report back to the ward where the patient* (is).[22] *This occurred on a daily basis.*[23] And further, *I wrote the policy, which is mainly focused on emergency department checking the result and how they deliver the result, but there is no policy I'm aware of how the different wards* (may file) *the result.*[24]

41. (In reference to Dr Chan's interpretation of the X ray, I note here that Professor Jelinek [25] considered that it was reasonable him not to have connected the presentation in the ED as evidence of an acute dissecting aorta). Dr Chan knew that Sally's history involved coarctation of the aorta, for which she was receiving care from Dr Goods.

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[19] See exhibit 3 statement of Dr Barry Chan dated 16 August 2016. There were no available relevant X-rays from which a comparison might have otherwise been made. See transcript 71. See also discussion of his reasons for non-classification of the presentation as aortic dissection at transcript 74

[20] Transcript 120. D

[21] Transcript 117, which nursing entry was properly bought to my attention by Mr McWilliams of Counsel.

[22] Transcript 121.

[23] Transcript 116.

[24] Transcript 118.

[25] Consultant Cardiologist Professor Jelinek, provided the Court with an expert opinion (see exhibit 2a), and gave testimony in respect of these matters.

42. Professor Jelinek's view was that notwithstanding the sharp back pain there were features about Sally's presentation, which made the presentation point away from an acute dissecting aorta. In this regard Dr Chan spoke of her pain in both legs, *which is never described in text books* ... (in connection with), *presentation of the dissecting aorta.*[26]

43. Further Dr Chan also knew that coarctation was a long standing rather than a new presentation. As coarctation can cause a widening of the mediastinum Dr Chan submitted that he was entitled to think that the widening was her usual presentation and not something he needed to be overly concerned about.

44. This view was also taken by Dr Loff and accounted for his belief that the moderate widening of the mediastinum with dilation of the upper aorta, represented a long standing feature of Sally's history, rather than evidence of a progressing or acute event.

Treating Cardiologist and Physician Dr Christopher Goods

45. As set out above, Sally attended the ED of Knox Private Hospital via ambulance on 23 March 2012 with a history over the preceding hours of back pain, and chest pain, plus leg and abdominal pain, nausea and vomiting. She was admitted to the CCU early on 24 March, 2012 under the care of her cardiologist from May 2005, Dr Goods. She had a past history known to him, of coaction of the aorta, hypertension, hyperthyroidism, Turners syndrome and bicuspid aortic valve. [27] Dr Goods explained that Turners Syndrome occurred, *where females have one X chromosome that causes various abnormalities in the body and specifically the heart. There can be commonly bicuspid aortic valves and coarctation of the aorta and increased fragility of the aorta.*[28]

46. Dr Goods also spoke of this background in his first statement at exhibit 6, dated 24 October 2013 and in the statement he provided to the Court through Hospital General Manager Mr J Greenwell, exhibit 2(a), dated 16 May 2016.

47. Further, in the statement provided through Mr Greenwell, Dr Goods stated that, *she was seen first in the Emergency Department, where a chest X-ray was ordered. The chest x-ray*

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[26] Transcript 97. See also report of Dr David Eddy. According to Dr Eddy the typical descriptions of the location of the pain associated with aortic dissection found in emergency medicine texts and papers on the subject relate to chest abdomen neck throat jaw face ear or inter scapular area,- not the leg or legs. In summary Dr Eddy stated, *the pain associated with acute aortic dissection may radiate to the neck or jaw or back and although type A dissections were often associated with chest pain, and type B dissections with posterior chest pain, there was a substantial overlap.* See exhibit 6(b) page 16. In addition while there are a number of signs and symptoms that tend to be associated with an acute dissecting disorder vomiting and nausea are also not included in those symptoms.

[27] See Dr Good's statement at exhibit 6 and evidence contained in a second statement submitted by the Hospitals General Manager Mr J Greenwell, exhibit 2(a) page1, on behalf of Dr Goods. I note here that on admission Sally had estimated her severity of chest pain at home at 8 out of 10.

[28] Transcript 229.

was not reported on the ward. As the cardiology team was not aware of the X-ray having been ordered, they did not follow up on the results or report.

I note here that while agreeing that this information had been given to Mr Greenwell for purpose of making his statement, that Dr Goods later retracted this evidence.[29]

48. Dr Goods also stated through Mr Greenwell, that *Ms Hopwood suffered from Turner's syndrome. This made her at risk of suffering from a type A aortic dissection. Ultimately she was found to have suffered a type B dissection. The risk of aortic dissection in Turner's syndrome is a consequence of the structural cardiovascular malformations and hemodynamic risk factors, (rather than a reflection of an inherent abnormality in connective tissue.)* The above bracketed evidence was later withdrawn by Dr Goods as being factually incorrect.[30]

49. Dr Goods testified that Sally was admitted with the above described presenting history and was assessed by the emergency physician, *with blood tests, a portable chest X-ray and ECG's performed. She was admitted to the general cardiology ward for further investigation and monitoring.*

50. Dr Goods also stated that, o*ver the following 24 hours (from 23 March) symptoms became mainly focused on the abdomen with nausea, vomiting and cramp like abdominal pains.* [31]

51. *Mrs Hopwood suffered from a very unusual Type B aortic dissection. It had dissected and perforated to an extent that is rarely encountered.* With the words, *very unusual,* and the whole of the second sentence later withdrawn by Dr Goods.[32]

52. Dr Goods also stated that, *Ms Hopwood suffered from a bicuspid valve and moderate coarctation of the aorta. Her risk of dissection arose from these abnormalities and was therefore a stable risk rather than a risk, which increased over time.*

53. Dr Goods offered a further opinion concerning the type B dissection, *probably less than 5% progress to perforation... If the dissection had been diagnosed she would have undergone surgery to stent the aorta... It is administered through percutaneously from the leg and that would be if there was-if it was non perforated it would be stented but if it had perforated, she would need open surgery...*

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[29] Exhibit 2(a) and transcript 219-220.
[30] Exhibit 2(a) page 2, and Transcript 223.
[31] Exhibit 6 page 1.
[32] Transcript 221, and 226-7.

54. Coroner Q… *The dissection caused her to indicate some of the symptoms? Yes.* Q. *That brought her to hospital... Yes.* Q. *But when in relation to her stay in hospital do you believe the perforation occurred?* A. *Probably in the last ... few hours...* Q. So if there had been a discovery of the condition earlier in the week might the *operation have been carried out by stenting?* A. *Yes.*[33]

55. Dr Goods stated that he reviewed Ms Hopwood every two years with echocardiograms because of her condition. Two months prior to her admission there was no evidence of widening or damage to her aorta, which reassured Dr Goods when he was assessing her on the ward on March 24. According to Dr Goods the repeat echocardiogram conducted earlier (on 23 January), showed a structurally functioning and functional normal heart and coarctation of the aorta.

56. Dr Goods further testified as to this matter. *I was you know, following her aorta. I realised she was an increased risk and I was checking her aorta regularly to see if the dimensions changed, particularly to see if there was any dilation, which would indicate increased further risk...* Q. *Were there any X- rays done of that area?* A. *I can't recall.* Q *X- rays done of the chest area?* A. *I can't recall if we did a chest X-ray.* Q *Were any CT scans done?* A. *I don't think we did a chest X-ray. I don't think so.* [34]

57. Coroner Q *...can you explain how the echocardiogram is used to measure the changes that may occur...* A. *So we get quite good pictures of the ascending aorta and the arch and with an echocardiogram we can measure the distance quite accurately, the diameter of the blood vessel and we know if the blood vessel…* Q. *You measure the diameter of the aorta?* A. *Yes we can measure it on the echocardiogram and it's a fairly standard with people we think an increased aortic dilation and rupture we routinely serially do echocardiograms to follow aortic size.* Q *Did you actually do a calculation?* A. *No, no it's just in the echo report we see the diameter and we compare them one to the following year. It's just a simple centimetre number...*

58. And later, *I should have stated that it hadn't changed in seven years.*[35]

59. It is common ground that Dr Goods did not examine the chest X-ray report that was available on the hospital computer system from the morning of 24 March 2012, and accepted in retrospect that he should have looked at that report. As to whether he saw the X-ray itself see discussion below and finding at paragraphs 113 to 118. As above the X-

[33] Transcript 228.
[34] Transcript 234.
[35] Transcript 234-6.

ray report concluded that, *if appropriate an MRCP or CT cholangiogram may add further information if the distal pathology is thought to be related to the patient's symptoms.*

60. Dr Goods also stated that if he had have examined the report he would have ordered a CT of her chest.[36] Concerning this omission Dr Goods testified that by 25 March 2012, *having seen the most recent echocardiogram taken three or four weeks ago that showed no dilation*, and that he therefore did not suspect, *any active pathology in the aorta.* Her symptoms suggested instead a pathology below the diaphragm. [37]

61. *I think if I had seen the report I would have got a CT... when we got the CT we would have done the whole lot, done a total body CT scan,* ***if I'd seen that X-ray.***

62. Mr McWilliams of Counsel for Dr Goods: *As far as the use of CT investigations does that involve administering radiation to the patient?* A. *Yes.* Q. *Is that a concern?* A. *Well, in routinely assessing chest pain the trend now is everybody gets a CT of the chest because we are all terrified of ending up exactly where we are today, so we CT everybody now and that's substantial radiation dose and increases the risk of malignancy in the population...*

63. Mr Cash of Counsel for Dr Chan: Q. *you were asked questions by Mr Halley (for Dr Loff), and you made a concession that you should have looked at the report. Is that a concession made by you given that we now know in hindsight... what the ultimate diagnosis of the patient is?* A. *Yes, Yes.*

64. Q. *At the time the report was available, i.e. after you had examined the X- ray yourself... and were in the hospital on 25 March and of the subsequent observations of this patient, and bearing those matters in mind did you have any reason to seek out the x-ray report?* A. ***Well Barry (Chan) had seen it and hadn't commented. I thought it was OK myself, and that was enough at the time with the way her symptoms had unfolded.***

65. Q *When was it you learnt of Mrs Hopwood's death? They rang me immediately...* Q. *What was your reaction?* A. *I was devastated.* Q. *Why?* A. *Well it was unexpected and obviously something had happened that I was you know, something dreadful had happened that I hadn't diagnosed.* (When I learnt from her brother that she had died of an aortic dissection), *I was even more devastated...* Q. *Why?* A. *Well because it's my sub-specialty, I should be able to pick these problems.* Q. *Had it been something that you had suspected given your treatment of the patient to this point?* A. *Yes.* Q. *In the light of the observations you had made throughout her treatment? I'm not talking about in retrospect? A Yes.* **Q. *But at the time you were treating her and up to the point where she died was aortic***

[36] Transcript 290.
[37] Ibid.

dissection a diagnosis that you had seriously considered during that period? A. No. I think when I went through my notes and saw the aorta was undilated, even though obviously there can be perforations in normal size aortas, and her change in symptoms I think I switched my mind off to that as being a possibility and (I) pursued pathology under the diaphragm. [38] The emphasis is mine.

66. Dr Goods was then further examined by the Court about an article by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, on Turner Syndrome [39] in which, *comprehensive screening and evaluation by a cardiologist with expertise in congenital heart conditions is essential for all patients with Turner syndrome at the time of diagnosis. The evaluation should include cardiac magnetic resonance as well as echocardiography and the ECG.* Q. *Is this the sort of response that you are talking about, the idea that the reliance on CT scanning has been introduced into this area of medicine?* A. *Yes. Yes... So if we are following aortic in Marfan syndrome we use MRI where we can now to stop – you can't give them serial CT scans because you increase the risk of malignancy, so we do use MRI's for following aortas.*[40]

67. Q. *Apart from your experience with dissecting aortas do you have any particular expertise in the area of congenital heart disease?* A. *No. I don't put myself forward as an expert in congenital heart disease.*

68. Q. *When did you learn of this history of coarctation of the aorta, or was that a condition that you treated yourself?* A. *No...* Q *So when did you learn of it?* A. *No. She had been previously diagnosed by another cardiologist...who retired and then she came over to my care.* Q *So you hadn't had experience of it with her?* A. *No. No. That was something she was born with, she had coarctation and she had been followed by another cardiologist and I took over her care in 2005 and continued to monitor her with echoes every two years.* Q. *You hadn't seen other evidence of coarctation ...in this patient?* A. *No.* Q. *It doesn't get smaller?* A. *It doesn't get smaller it doesn't usually get tighter, no.*[41]

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[38] Transcript 290-3. I note that Dr Chan's only involvement was at Sally's admission (and following until his shift finished at midnight on 23 March), where he reviewed the x-ray, but not the x-ray report.
As above, Dr Chan believed he had called Dr Goods but was somewhat uncertain about this matter, as he did not at that stage suspect a risk of an aortic dissection, or related event. I further note that Dr Goods refers as set out above, to not seeing the x-ray at all, and that it appears the practise between the two was such that Dr Goods would have expected a call from Dr Chan if he had seen something on the x-ray, which caused him concern. See further at Findings section below.

[39] See exhibit 6(d).

[40] Transcript 295-96.

[41] The comments by Dr Chan in the CCU synopsis corroborate his testimony that he saw the X-ray and became aware of a widened mediastinum and dilation of the upper aorta.

Treating Radiologist Dr Marcus Loff

69. As set out above the chest X-ray was performed at 10.19 pm on 23 March 2012, following Sally's admission. Dr Chan noted a widening of the mediastinum and interpreted this as a long standing radiological feature and did not consider an aortic dissection as a potential diagnosis.

70. There had been no request from ED specialist Dr Chan that the reporting on the X-ray should be treated as urgent. (Dr Chan considered that a qualified ED physician should be able to interpret the X-ray, without such assistance).

71. Dr Loff viewed and dictated a report on the x-ray at approximately 10.05 am on 24 March.[42] The report was transcribed and signed off on electronically by Dr Loff at 12.22 pm, and thereafter became available at all computers at the hospital.[43] In addition a hard copy was sent to the ED and the CCU, meaning that it was readily available to any clinician who wished to view it.

72. As above in his report Dr Loff noted the widening of the mediastinum with dilation of the upper aorta, and added, *Given the patient's past history this may represent a long standing feature but if active pathology is expected, a CT would be of use.*

73. Dr Loff, (and Dr Chan) did not view the finding of the X-ray of widening of the mediastinum as a critical finding, as they both considered it more likely that it was a longstanding presentation.

Dr Phillip Danby [44]

74. Dr Danby a Physician and Consultant Nephrologist, first saw Sally on 27 March 2012, at the request of her primary physician Dr Goods. Dr Goods also organised a second opinion from an upper gastro-enterologist surgeon, Mr Michael Bickford. Dr Goods told Dr Danby about Sally's history and asked Dr Danby, *whether I would see her because of her ongoing abdominal pain and fever.*

75. Dr Danby noted Sally's medical history including Turners Syndrome and Hypertension, and that she was admitted on 23 March 2012 with, *some chest pain and epigastric pain,*

[42] Exhibit 2e.
[43] Transcript page 48 25-50 and 143.1 to 144.23.
[44] Dr Danby was employed at Knox Private Hospital as a Consultant Physician and Nephrologist, (but primarily a general physician according to Dr Goods, transcript 283). He first saw Sally on 27 March at the request of Dr Goodes. According to Dr Goods he had invited his involvement because he wanted an assessment by a general physician. Ibid.

nausea and vomiting. When he saw her on 27 March however, she had no chest pain, some mild epigastric pain and nausea.[45]

76. *Dr Bickford specialty was gallbladder and liver biliary tree and I believe it was he that ordered the CT cholangiogram to further define her hepatobiliary system as to whether that was the cause of her abdominal pain and fever.*[46]

77. She also had a low grade temperature of 37.9 and an elevated inflammatory marker with a CRP of 230 and some mildly abnormal liver function tests. Dr Danby further proffered that following his investigation by cholangiogram, Dr Bickford determined,

CT cholangiogram, no evidence of a duct stone or obstruction. Mild bilateral effusion with collapse and consolidation of both lung bases.

According to Dr Danby, *This meant that as soon as it was established that there was no stones or structural hepatobiliary problem,* ***that it followed that there was no indication for an operation.***[47]

... And (She) was under the care of a cardiologist who I greatly respect, and who had been carefully following her ultrasounds and she had had a recent ultrasound as well.[48]***... if someone is in under a cardiologist for a cardiological condition I take that as pretty good evidence that I have to look for an alternative diagnosis and alternative explanation.***[49]

78. In response to a further question about aortic dissection Dr Danby stated, ***I base what I do on what other things are actually occurring around it so if someone came in to the ED and was not seen by anyone with these findings, I would manage that differently to if it's come out of a coronary care unit, out of the care of a cardiologist.***[50]

79. In his statement, Dr Danby also commented, that the reason for her admission was not ***really clear, although she had had some cough.*** *At that time she had a chest X-ray which showed a widened upper mediastinum, but in the setting of a known coarctation and a regular cardiological and ultrasound review.* [51]

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[45] Exhibit 5 page 1.
[46] Transcript 164. I note here that the CT cholangiogram was the same examination recommended by Dr Loff in the X-ray report and did in fact provide a finding that Professor Jelinek later found to be significant.
[47] Transcript 165.
[48] Transcript 177.
[49] Transcript 182.
[50] Transcript 183.
[51] See exhibit 5 page 1.

80. Dr Danby further stated that he saw her again on 28 and 30 March 2012. He had no plans for follow up as she was being followed up by Dr Goods. On the latter date he noted a question mark then */C Sat, which means that I've said it's possible she may be discharged soon... **However that doesn't mean that's my plan.***

81. Rather he felt, ***uncomfortable ...: that we didn't have a clear diagnosis ... I like to have a hard diagnosis and I've never felt comfortable that we had a hard diagnosis in this woman.*** *I accept in medicine that some things will get better and you will never have a diagnosis but I don't like that.* [52] The emphasis is mine.

Professor Michael Jelinek [53]

82. Professor Jelinek recorded that Sally had presented with the abrupt onset of sharp pain in the back of her legs, nausea and vomiting, and later severe pain in the chest and abdomen. While at home she rated her chest pain severity at 8/10. This commenced at midday on 23 March 2012 and an ambulance was finally called at 8.48 pm.

83. ED notes on admission confirmed she was known to have a past history of Turners syndrome, coarctation of the aorta, hypothyroidism, hypertension and depression. She was followed regularly by Dr Goods who noted in his statement that,

Patients with Turners syndrome and known bicuspid aortic valves with coarction of the aorta are known to have pathological aortas, which may be more than a 100 times more likely to rupture than normal aortas (see Mortensen and others attached). However, rupture of the aorta is an uncommon clinical event in people without known aortic aneurysms, and the diagnosis is not commonly suspected even in excellent medical centres...

What was missing in the initial admission ... is the formal viewing and report from the mobile chest X-ray performed in the ED. Having seen this X- ray, I am sure that Dr Goods would have suspected the possibility of a ruptured aorta in this case.

Ms Hopwood was investigated for acute abdominal pathology after her admission to the hospital. She had an abdominal ultrasound, which was inconclusive followed by a CT cholangiogram Dr Bickford) and review by Dr Danby. The CT choliagiogram on 26 March 2012 excluded gallstone pathology but did report on mild bilateral effusions with

[52] Transcript 198-99.
[53] Professor Michael Jelinek is a Consultant cardiologist and gave evidence as an expert witness on matters cardiological. Transcript 303.

segmental collapse and consolidation at both lung bases. ***This should have alerted Dr Goods and his colleagues to the possibility of a ruptured aorta in this woman with Turners syndrome and known coarctation of the aorta. Instead (she) was treated for pneumonia and appeared to respond favourably.*** *But she did develop further abdominal and back pain on 30 March 2012. The doctors acknowledge that they did not know why she had these symptoms and this was not pursued further...* ***this subsequent history on 26 and 30 March should have alerted her doctors to the possibility that she had a leaking aneurysm which could rupture.*** The underlining is mine.

*In summary Ms Hopwood was someone in whom a diagnosis of leaking abdominal aneurysm should * have been suspected. The absence of viewing and formal reporting of the chest X-ray, which was done in the ED was a significant oversight in this case. However the clinical course and the results of the CT choliagiogram did allow the treating doctors to have a second thought on the diagnosis and treatment in her case.* [54]

84. In testimony Professor Jelinek further offered that he agreed with Dr Loff's assessment that the X-ray result suggested that if active pathology (of the aorta) was suspected, a CT would be of use. He also agreed that without an earlier X-ray to compare it with it was not possible to understand whether the widening had recently occurred and was *acute* or was part of a chronic presentation.

85. Professor Jelinek further offered **that the X-ray exhibit 2 (f), itself disclosed evidence of a bleed. Q.** ***Is that something that you would have expected Dr Goods to as a cardiologist to have recognised? A. Yes... After that the die was cast and there was actually an opportunity to go back but he never went back. But when you saw this in the context of that presentation in a person with ... pathology of the aorta, it should have been a CT scan immediately on the 24th.***[55] The underlining is mine.

86. Professor Jelinek additionally stated that Dr Goods should have sought to see the X-ray report... *in the context of this lady with Turners syndrome, coarctation, bicuspid aortic valve, these are all predispositions to aortopathy and once you know that you would have - I think you should have looked to the X-ray report, - no to the X-ray itself.* [56] He also considered that before looking for something below the diaphragm, *they should have been looking at something else* (in the chest), *which fitted this picture, which is this.* He further

[54] Exhibit 2(a) page 2. * The word 'should' was amended to 'could,' during Professor Jelinek's testimony. See transcript 303.
[55] Transcript 312-13.
[56] Transcript 314.

testified that aortic dissection is an unusual event, with Dr Goods seeing 1 every two or three years only.

If you don't think of it you don't think of it and you just keep going in the same direction from where you started.[57]

87. Professor Jelinek further stated that that additional imaging should have been taken in the CCU irrespective of the results of the echocardiogram on 23 January. Masking of the underlying condition may have occurred on that date. *Your looking for an uncommon manifestation of an uncommon condition and he had had good imaging of the ascending aorta but you don't get imaging of the descending aorta by this technique, (the echo* cardiogram)... Q. *So that wouldn't give an indication of a type B (dissection)?* A. *No.*[58] Q *So if he had been relying on the echocardiogram in the years previous that (wouldn't have given him an indication of widening that may have been taking place ...on the left side?* A. *Yes. That's correct... It would not have looked at the descending aorta at all. What it looks at is the ascending aorta as it comes out of the heart and looks at the valve function, whether it's more narrow, sic, or more leaky. That's the purpose of the serial echocardiograms, but it won't tell you anything about the descending aorta.*[59]

88. Professor Jelinek was then questioned by Mr Cash, Counsel for Dr Chan about his management of Sally's presentation in the ED and specifically about his failure to order a CT. Dr Jelinek discussed that management and concluded that he had no adverse comments to make about Dr Chan.

89. Professor Jelinek was then questioned by Mr Halley representing the radiologist Dr Loff. He described the coarctation which had occurred in this case as wider rather than narrower, with Sally's system tolerating it without surgical intervention. It had caused her to require treatment for high blood pressure, *which is a classical thing in this situation.* [60]

90. He further described the coarctation by reference to the X-ray and discussed the positioning of widening of the mediastinum. He agreed that Dr Loff's summary in the X-ray report was, *an excellent summary.*

91. Counsel for Dr Danby, Ms Foy, further questioned the witness. In response Professor Jelinek agreed that Dr Danby was a consultant nephrologist and physician and saw Sally following a review by Dr Bickford. He also agreed with Counsel that as he was providing a

[57] Transcript 315.
[58] Transcript 317.
[59] Transcript 320-21.
[60] Transcript 326-27.

second opinion to Dr Goods who was a consultant cardiologist that he should defer to the opinion of Dr Goods in respect of matters to do with his specialty.[61]

Professor Jelinek was then questioned about the CT cholangiogram report obtained by Dr Bickford and whether he agreed that the mild consolidation of the lungs would suggest infection. Answer. ***I think that if you take the whole presentation into in context, I think that was just whistling Dixie. That was not on. That was desperately trying to find an answer to an unsolved problem.***[62]

92. Mr McWilliams, for Dr Goods, then questioned Professor Jelinek, who agreed that the condition is often fatal and further that a type A dissection (ascending aorta), has a greater rate of mortality than a type B dissection, (descending aorta). He also agreed that a type A dissection was, *easier to diagnose and has more lethal complications and it can be treated immediately by open heart cardiothoracic surgery. The type B... is less often diagnosed and is less often fatal,*[63]

93. Professor Jelinek was then referred to Dr Eddy's paper on aortic dissection.[64] He spoke glowingly of the authors knowledge of the subject matter accepted that input from the ED was important in the treatment of aortic dissection. He further agreed with comments quoted from Rosen's textbook on Emergency Medicine.

Pain is by far the most common presenting complaint affecting more than 90% of patients. Most patients of painless aorta dissection are chronic in nature. The pain is usually excruciating. It occurs abruptly. It is most severe in the onset and is typically described as sharp more often than tearing or ripping. The location of pain may help localise the dissection. Anterior chest pain is associated with the ascending aorta.

Neck and jaw pain with the aortic arch, Q. *Do you agree with that? A. It's an overlap. This is typical but it may not be in any particular case.* [65]

94. Professor Jelinek agreed that these were the *hallmarks* of aortic dissection, whether type A or type B.

95. Professor Jelinek was also referred to 3 Textbook on Adult Emergency Medicine, which talks about *severe ripping pain* and the site of the pain. Professor Jelinek was not familiar

[61] Transcript 329.
[62] Transcript 330.
[63] Transcript 331.
[64] De Eddy's paper on aortic dissection was contributed to by Professor Dr George Jelinek, who was also an ED physician.
[65] Transcript 334.

with the text as it was an *Emergency* text. He agreed that the texts suggested by inference that an experienced ED physician should be able to identify that if someone presented with such symptoms that person may be suffering from aortic dissection.

Q. *If presented bearing these hallmarks then that would be something identified as a problem? A. I would expect that they could, perhaps should, but he did admit the patient to the hospital under the appropriate specialist.*[66]

96. Under further cross examination Professor Jelinek agreed that Dr Chan had reviewed the X-ray and identified a widening mediastinum in the location identified by Mr Halley. He further agreed that at this point if Dr Chan had any concerns about Sally that he was able to order a CT himself, *but at 10 or 11pm at night he didn't think that was appropriate.*

97. Professor Jelinek was then asked whether the fact that a CT was not ordered by the ED physician, *and bearing in mind that the anterior chest pain had gone,* that it was reasonable for Dr Goods and Bickford and Danby, to simply treat her as a patient presenting with abdominal symptoms. Professor Jelinek did not agree,

... the patient presented with abrupt catastrophic onset of back pain and chest pain and then epigastric pain of a sharp kind which eventually forced her to come to the ED. It was not an abdominal problem. Abdominal problems do not present like that.[67]

98. Under further questioning Professor Jelinek again agreed that the hallmark of aortic dissection was *unremitting or unrelenting pain.* He also agreed that if someone made such a complaint but then that pain dissipates, that that would be *an unusual presentation... a difficult presentation.* He also agreed that it is a very difficult condition to diagnose especially when the symptoms are atypical, that cardiologists may only see it once or twice a year and that it is common for the diagnosis to be missed.[68]

99. Professor Jelinek was then taken to the progress notes. (Brief 92-113). And asked about the CCU nursing notes, which talked about the symptoms experienced on the previous evening at home and in the ED and the symptoms complained of at her initial examination in the CCU when the patient, *was pain free and comfortable.* Professor Jelinek was then referred to the ambulance officers note, which doesn't refer to severe chest pain, *but given the initial complaint was for sharp pain in the back and legs and then later developed discomfort in lower central chest and epigastric region, that isn't something which*

[66] Transcript 337.
[67] Transcript 339.
[68] Transcript 341.

screams out immediately for problems involving aortic dissection? A. *No... **but I remind you as we have discussed, this is a woman with Turner's syndrome, coarctation, bicuspid aortic valve and aortopathy. Morteson's paper, which I did submit,*** (**suggests**) ***it is 100 times as*** (**likely**) ***to cause dissection as a person who is not-it's her total picture including the background.***[69] ***In this case he had access to the echo, to the ascending aorta just above the valve and the valve itself, and you can't see the downside of it... the descending aorta... and as soon as they went looking below the diaphragm they were looking without-away from the problem the presenting problem. But even if I accept that was understood we're left with the fact that after the gallbladder study, she was found to have fluid in both plural cavities and collapse of the lungs and that should have re-routed them back up to the aorta or to the thoracic cavity at least.*** **Q.** ***That presentation in the lungs can be consistent with pneumonia can't it?*** **A.** ***No.*** (**And later**) ***... that was not the presentation of pneumonia.***

100. Professor Jelinek later testified as to the course of the deterioration with the initial bleeding occurring on or about admission, followed by a period in which the bleeding was sealed and there was no bleeding for several days and the dissection later occurring. Such a course was not uncommon.[70]

101. Professor Jelinek was further questioned about the course of treatment of, *abdominal pain* with pethidine and later on 28 March, ultimately with Panadol. At this time there is no mention of chest pain.

It was very difficult I grant you that. The emphasis is mine.

102. He was then questioned about hindsight and agreed that he gave his opinions knowing the ultimate cause of death.[71]

103. Professor Jelinek was then taken to the fact that there was a failure to mention chest pain on those two days (March 27 and 28) and then pain between the shoulder blades on the following day, *like lying on a knotted towel 3 out of 10, ...* Interscapular pain, which could be a symptom of dissection of the descending aorta, if the pain was more severe. *Together with the fact that, it's on and off again, is something, which is not something that screams aortic dissection is it?* A. *No.*[72]

104. This occurring when the CT Cholangiogram had indicated that gallstones were not a contributing feature. Q. But again your comments are ... *unwitnessed?* A. *Yes.* Q. *The*

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[69] Transcript 345
[70] Transcript 346-48.
[71] Transcript 352.
[72] Transcript 355.

patient is feeling nauseated not feeling well enough for lunch. She stated she is feeling 8 out of 10 pain ... given 60 mg of pethidine ... later complained of 6 out of 10 pain... rest in bed unable to ambulate... Vital signs attended to. Patient complained of 6 out of 10 pain at rest and 10 out of 10 pain on movement. Again there is no description as to where its located? A *Yes.*[73]

105. And later, Q *And given that we are looking at best as we can from the perspective of the clinician dealing with this patient and presenting with these particular symptoms, it is not something which you would readily expect a clinician to identify...?* A *No I agree...except I do remind you that she presented with catastrophic onset of pain at 12 midday on the 23 rd and that was her presentation in a lady with Turners bicuspid valve coarctation where the instance of aortopathy is such that you should-if you don't think of it you don't go there.* ***And when you had the negative cholangiogram for gallstones it happened to show fluid in both lungs. It should, I believe have raised the thing above the diaphragm, but not pneumonia.***[74]

106. Court. Q. *Your comments are there we know what happened. But you are not saying that all of your comments arrive from the fact that we know what happened. As I understand your evidence you've addressed the evidence and you've said on this presentation on her admission, a lady with these conditions should have been addressed down a particular pathway, and your saying that didn't occur? ...* A. *And having missed it and having been brought back again by the fluid in the pleural cavities , to think again, start at the beginning thinking wise, you know, she's still alive, I think pneumonia was a bad choice...*Q. *You're saying that the presentation at that time with a woman with this background necessitated taking a particular pathway. When it wasn't taken there was a second opportunity to take it and that opportunity was lost also?* A. *Yes.* Q. *With hindsight we know what happened?* A. *Yes.* Q. *But it wasn't about knowing what happened, it was about conducting an investigation?* A. *Yes, treating the patient.*

107. Mr McWilliams: In reference to the widening of the mediastinum, *the CCU Synopsis states ... "shows a moderate widening of the mediastinum," whereas you say in your statement that the widening it is "strikingly abnormal." A That's my personal observation...(It doesn't matter). It was in a position in this context I thought it highly significant.*

108. *Dr Goods saw the X-ray film early on the morning the following day when he got into the hospital and did not note anything remarkable about it given this woman's previous presentation... a mild widening of the mediastinum is not something that should alert some*

[73] Transcript 357.
[74] Transcript 358.

extreme response in a clinician. Do you agree with that? ... A. Not in the ED. But on the 24th when she was in the ward with that presentation (that CT) – that X-ray warranted a CT. Q. *But at that point there was no more chest pain, we know that much?* A. *It doesn't matter.*

109. Coroner: Q. *If a CT had been done on the 24th would it have continued to show that there had been bleeding or that a bleeding was now occurring? A. It is likely to Sir. We don't know...It is likely to have shown there were in fact two lumens, and that's a classic sign on a CT Scan of a dissection.* ***Had that diagnosis been made she may have been able to be treated by a percutaneous stent, which has been mentioned, to block off the leak. Q...that would have been done by way of? A. By a radiologist or vascular surgeon through the femoral artery. Q At what point in her history do you believe that such action couldn't have been taken? A. That was the second time when they showed the fluid, (if they) had they gone back to square one and gone down the right pathway it still could have saved her. She could have been saved any time until she bled to death. She was unlucky. Dr Goods was unlucky, but that is how it happened.***[75] The emphasis is again mine.

FINDINGS [76]

110. Having applied the applicable standard of proof to the available evidence and considered all submissions I make the following findings.

111. I find that following admission and at different points thereafter, Sally's was a confusing presentation with certain symptoms notably those concerning pain and later fever, sometimes pointing away from a progressing or leaking aneurysm. Her presentation however also included a reference to severe left sided chest pain, back pain and later epigastric pain on the afternoon of 23 March, (which she assessed at 8/10), which ultimately caused Sally to call for an ambulance that evening.

112. Upon her arrival Sally was seen in the ED by Dr Chan who ordered various tests not including a CT of the chest. Dr Chan referred Sally to the CCU and the care of a cardiologist, Dr Goods, who had previously been managing her for her Turners syndrome, coarctation of the aorta and bicuspid valve.

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[75] Transcript 359-67."(If they had)" has been added to reflect the intent of the evidence on this issue.

[76] The standard of proof for coronial findings of fact is the civil standard of proof, on the balance of probabilities, with the Briginshaw gloss or explication. Adverse findings are not to be made with the benefit of hindsight but only on the basis of what was known or should reasonably have been known or done at the time.

113. In so far as it is relevant to that management, I find that Dr Goods gave inconsistent evidence about the nature of her underlying condition, as well as to when the last echocardiogram had been taken prior to Sally's admission on 23 March. [77] Similarly as to whether he had ever actually viewed the X-ray ordered by Dr Chan. [78]

114. Dr Goods' testimony was that he had relied throughout his seven year management of Sally upon the bi-annual echocardiograms, and the measurements provided within reports on that procedure, to establish that there had been no recent widening of mediastinum.

115. Whether Dr Goods felt able to rely upon an X-ray rather than an echocardiogram to assess if Sally was at increased risk of leakage remains uncertain. In this regard it is relevant that Professor Jelinek testified that he would have expected Dr Goods to have been able to interpret the X-ray. I further note that Professor Jelinek testified that an echocardiogram would not be effective in assessing the descending aorta for evidence of a Type B dissection, as we now know this was.

116. As to the X-ray report it is also the case that Dr Goods indicated his view that in the context of a portable X-ray, *we prefer to see the report.*[79] He also accepted that the report would have been available to him from 25 March 2012 and that he knew it was readily available to him, and that his failure to do so was an omission.[80] He additionally observed that given portable chest X-rays were, *not that good at assessing the heart and mediastinum,* (that this) *was a further reason why he should have reviewed the report,* and that he was uncertain whether earlier chest X-rays had been taken. [81]

117. Additionally Dr Goods testified that if he had been aware of the contents of the report that he would have followed Dr Loff's advice and undertaken the recommended CT examination.[82]

118. In the result I leave open the question of whether Dr Goods actually viewed the X-ray before deciding to put aside complications of Turners syndrome as a potential

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[77] As to the inconsistent evidence concerning the nature of her underlying condition see paragraph 119 below. As to the inconsistent evidence concerning the date of the last echocardiogram see paragraph15 above. Further Dr Goods considered that the last echocardiogram testing, which showed no deterioration, offered support for the later decision to dismiss complication of Turners syndrome as the possible reason for her ongoing symptomology.
[78] See paragraphs 47, 61, 64, and 65 above. See also the evidence of Dr Goods earlier reliance on receiving a phone call from then ED head Dr Chan (at paragraph 34), to inform him in those instances where evidence of an ongoing cardiac issue had emerged during an ED investigation of any of his patients. See also Dr Chan's opinion as it related to his expectations in respect of Sally's X-ray and its interpretation by ED Physicians at paragraph 32 above.
[79] Transcript page 273.
[80] Transcript 274
[81] Transcript 275.
[82] See paragraph 61.

contributing factor, and instead to seek input from Dr Bickford and then Dr Danby in respect of a possible source of difficulty emanating from her lower diaphragm.

119. I further observe that Dr Goods conceded that he was not an expert in genetically inherited heart disease. [83] His later correction of technical evidence concerning Turner's syndrome, earlier supplied by him to the Court through Knox Hospital General Manager, Mr J Greenwell, is viewed as consistent with that concession.[84]

120. Also relevant to Dr Good's management of Sally was the failure to identify and respond to the results of the CT choliagiogram, on 26 March 2012, which reported, *mild bilateral effusions with segmental collapse and consolidation at both lung bases.*

121. Having now reviewed all of the evidence together with Counsels submissions I accept Professor Jelinek's opinion concerning the progression of Sally's condition from the onset of her deterioration prior to her transfer to Hospital, until her passing 8 days later.[85]

122. I further find that given Sally's presenting symptoms, which included severe chest and back pain and later a lesser epigastric pain, from midday on March 23, in a woman with Turners Syndrome and coarctation, (with a known bicuspid aortic valve, and her later changed presentation on arrival in the CCU and thereafter), were not reflective of an abdominal issue and that a CT of the chest should have been undertaken, to seek to exclude an aortic pathology, as soon as Dr Goods became aware of that presentation.

123. I additionally find that Dr Good's later failure to seek out the X-ray report before reaching the decision to focus on the lower diaphragm, was not supported by her medical history and early symptoms and was a significant failure in his administration of care.

124. I am also satisfied that a second opportunity was missed when the CT Cholangiogram results, consistent with a bleeding into both lungs, became known on March 26 and that at that time Dr Goods should again have followed an aortic aneurysm pathway and ordered a CT of the chest.

125. Additionally I find that Dr Goods was misled and that what was an aortic leakage on March 23, later slowed or stopped with her bleeding subsequently re commencing and becoming acute, leading to death.

126. More generally I am further satisfied that an aortic aneurysm pathway might reasonably have been pursued at any time after admission, this because of Sally's relevant history and the fact that during her stay at Knox Hospital there had been change, but no general

[83] See paragraphs 67 and 68.
[84] See discussion with counsel at transcript 310, and paragraph 48.
[85] See paragraph 100

improvement in her condition, and no diagnosis achieved. This course should also have been pursued given her early severe chest and back pain, and again because of the consistent evidence later established by the CT cholangiogram. [86]

127. As to the involvement of other medical professionals and their interaction with Dr Goods, I note that Dr Chan, understandably, gave uncertain evidence as to the content of their conversation at handover. I am satisfied that at that time Dr Chan had seen the X-ray and observed the widened mediastinum. I also note that Dr Chan did not consider that it was likely that Sally's presentation suggested a possible complication of her Turner's syndrome, this because of her leg pain together with his further belief that her widened mediastinum was likely a result of her coarctation, which he knew was a long standing condition.

128. On all the evidence I find that while the results of the recent X-ray were raised by Dr Chan that, at handover, little if any consideration was given by the parties to the possibility of bleeding from her aorta.[87]

129. I note Professor Jelineks evidence that he had no adverse comments to offer about Dr Chan's failure to consider aortic dissection as a potential diagnosis, (given the atypical presentation he had to review). I accept this view and also consider that Dr Chan was entitled to place at least some level of reliance upon the future publication of Dr Loff's anticipated X-ray report, as directly informing Dr Goods of any possible issue concerning the progression of Sally's underlying condition.

130. However in the particular circumstances of this case I find that that is not the end of the matter, and I take this opportunity to comment on a further issue connected to this death.

131. It is relevant that at the time of his discussion with Dr Goods, (absent earlier chest X-rays), that Dr Chan was not in a position to make a comparison of those results, to know whether the most recent X-ray finding of a widened mediastinum was in fact longstanding and could therefore be properly explained as a product of Sally's known coarctation.

132. This was a difficult presentation and I was favourably impressed by the fact that Dr Goods by his actions, demonstrated a willingness to seek advice from respected senior colleagues. While I believe this must be obvious, I further record my view that in similar circumstances consultant specialists working in a hospital setting are always likely to benefit from conferencing with their peers.

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[86] See paragraph 68.
[87] See paragraph 43.

133. In this context reviewing ED consultants should, at handover, seek to provide a full report with the receiving physician given the opportunity to consider the thoughts of the ED physician, advantaged by his/her initial examination and investigation, together with the details of the patient's most recent clinical history. The receiving physician should also participate actively, while seeking to ensure his/her best understanding.

134. In this instance, the referral of Sally's case to Dr Goods offered an opportunity for the two physicians to discuss the matter to include inter alia, the possible significance of Sally's medical history, her early severe pain to chest and back, the chest X-ray results and the need or other for further radiological input. Such discussion might also have included mention of how the view that the widening of the mediastinum was longstanding, should be confirmed. Regrettably such a conversation did not occur in this instance.[88]

135. Dr Goods faced Sally's fluctuating presentation over a relatively lengthy period, concerning which he had taken advice. Had both Dr Chan and Dr Goods given a greater level of emphasis at handover to these aspects of her early presentation, it seems likely that at some point Dr Goods would have ordered a CT to Sally's chest, and been assisted towards the correct diagnosis.

136. In relation to Dr Danby, I have again reviewed the evidence of Professor Jelinek. I also note that Dr Danby saw Sally over the 27-29 March, 2012. This included the opportunity to reference the results of tests ordered by Dr Chan including the chest X-ray and the CT Choliagiogram ordered by Dr Bickford and received on March 26.

137. As the investigation of her condition and her treatment unfolded over this period I am satisfied that Dr Danby felt increasingly troubled by Sally's symptoms and the collective failure to achieve an understanding as to their cause.

138. In such circumstances I find that once doubt set in, Dr Danby should have responded differently. He was an experienced physician and knew of Sally's past medical history and had followed the analytical path adopted by Dr Goods. While I am satisfied that Dr Danby carried out his duties reference the lower diaphragm within the parameters of the review request, I also consider that he might reasonably have sought to confer further with Dr Goods about his ongoing concerns.

139. This was not a question of simply deferring to Sally's cardiologist, but rather a missed opportunity for the two men to enter into a discussion about different possible pathways.

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[88] See paragraph 128.

I appreciate that such a discussion may have seemed to Dr Danby to be professionally awkward, but in the circumstances of this case, I do not accept that this is an acceptable reason for not seeking to further engage.

140. Turning now to the publication of the radiology results, I accept Professor Jelinek's assessment concerning the quality of Radiologist Dr Loff's, X-ray report.

141. I am also persuaded that the reporting was in compliance with the Schedule 3 Performance Criteria of the service level agreement between Knox Private Hospital and Healthcare Imaging Victoria, as the request for the report had been classified by Dr Chan as clinically non urgent.[89]

142. I extend to the family of Sally Hopwood my sincere condolences for their loss.

143. This concludes my finding. I thank counsel, instructing solicitors and Mr Hopwood for their assistance. I direct that a copy of this finding to be provided to the following:

The family of Sally Hopwood

Dr Christopher Goods

Dr Barry Chan

Dr Phillip Danby

Dr Marcus Loff

Professor Michael Jelinek

The Chief Medical Officer Knox Private Hospital

Manager Coroners Prevention Unit, Attention Dr Sandra Neate

A/Sergeant Andrea Hibbins

Signature:

Peter White
CORONER

Coroners Court of Victoria

Date: 21 December 2017.

[89] See paragraph 32.