IN THE CORONERS COURT
OF VICTORIA
AT BALLARAT

Court Reference: COR 2009 / 5114

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)
Section 67 of the ***Coroners Act 2008***

Inquest into the Death of: NEVILLE ROSS

Delivered On:	21st August, 2014
Delivered At:	Coroners Court of Victoria 65 Kavanagh Street SOUTHBANK 3006
Hearing Dates:	3rd February 2014 to 6th February 2014 and 15th and 16th April 2014
Findings of:	JACINTA HEFFEY, CORONER
Representation:	Leading Senior Constable Tania Cristiano – Police Coronial Support Unit Mr D Wallis of Counsel – Acting for Ballarat Health Mr S Maloney of Counsel – Acting for Dr Manish Mittal Ms F Ellis of Counsel- Acting for Dr Alexius Meekin

I, JACINTA HEFFEY, Coroner having investigated the death of NEVILLE ROSS

AND having held an inquest in relation to this death from 3rd February 2014 to 6th February 2014 and on the 15th and 16th April, 2014

at BALLARAT CORONERS COURT

find that the identity of the deceased was NEVILLE ROSS

born on 25th April, 1944

and the death occurred on the 28th October 2009

at Ballarat Health Services, Drummond Street North, Ballarat 3350

from:

1 (a) CARDIAC TAMPONADE WHILST UNDERGOING CT-GUIDED PERICARDIOCENTESIS

in the following circumstances:

1. On the 28th October 2009 Mr Ross drove with his wife, Mrs Diane Ross, the one and a half hour trip from their home in Stawell to Ballarat Health Services ("BHS") in order to undergo an echocardiographic examination (hereinafter referred to as "echo"). He was examined clinically by Cardiologist Associate Professor Romulo Oqueli-Flores (Dr Oqueli) after the technician performing the echo asked the latter to review Mr Ross as he was concerned that he was looking unwell. After conducting a clinical examination and reviewing the echo, Dr Oqueli diagnosed cardiac tamponade and asked his registrar, Dr Christabel Kelly, to arrange to have Mr Ross undergo CT-guided pericardial drainage (pericardiocentesis) for both diagnostic and therapeutic reasons. At around 2.15 PM. Dr Kelly examined Mr Ross and wrote up notes of that examination. She took Mr Ross through the consent process. She telephoned Mr Ross' general practitioner in Stawell, Dr Arthur Obi and sought information about his recent CT scan and this was sent on to the hospital. She subsequently spoke with Dr Manish Mittal, a Radiologist at BHS, to arrange the procedure. Subsequently, arrangements were made for the procedure to be performed later that day in the CT room. Dr Mittal also spoke to Mr Ross and took him through a further consent process.

2. The procedure (that commenced shortly after the planning stage had finished at 5.37 PM and continued until the needle was withdrawn at shortly after 5.56 PM) was unsuccessful and no fluid at any stage drained into the cannula of the needle. Shortly after the needle had been withdrawn, Mr Ross complained of feeling strange and went into cardiac arrest. A Code Blue was called and an emergency team, including Dr Oqueli, attempted resuscitation without

success. In the course of the resuscitation effort, an attempt was made to drain the pericardium. It would seem that in the course of this, the myocardium was penetrated and blood flowed into the pericardial sac. After 30 minutes without any cardiac output, notwithstanding an active resuscitation effort, the process was abandoned as unsuccessful and death was recorded at 6.29 PM. At autopsy, two defects up to 5 mm penetrating the right ventricular cavity were found and 450 mls of blood and clotted blood in the pericardial sac. Based on those findings at autopsy, the cause of death was given by the forensic pathologist as haemopericardium with tamponade during recent pericardial drainage procedure. As stated above, I am satisfied, however, that the defects observed on post-mortem examination had occurred during the attempted resuscitation process. I consider that Mr Ross was already dead at that time.

Cause of death

3. I consider that the cardiac arrest was a result of a perforation of the right ventricle in the course of therapeutic pericardial drainage leading to cardiac tamponade.

Reasons for Inquest

4. Mr Ross' death was reported to the Coroners Court, although not before Dr Obi was contacted by BHS and asked to prepare and sign a Death Certificate. Dr Obi quite correctly refused to do this. It was a "reportable death" on two bases: the death was unexpected and it occurred during a medical procedure. It was not, however, of a class in which a coronial inquest is required to be held. An inquest was conducted at the request of Mr Ross' widow, Mrs Diane Ross, she having persuaded the Court in correspondence that there were a number of areas that needed further investigation. In short compass, these may be summarised as:

    A. Was pericardiocentesis warranted in the circumstances?

    B. If so, was it performed in a manner that was safe?

5. In the course of the hearing, in relation to both these issues, evidence was heard and views advanced by a number of medical practitioners, some of whom had been involved in Mr Ross' care at Ballarat Health on the day of his death and others engaged as independent expert witnesses by those doctors, the Hospital and on behalf of the family, to review the case. In addition, Dr Hemant Chaudhary, who had been Mr Ross' treating cardiologist since 1997, provided statements and gave evidence, as did the aforementioned Dr Obi. The court heard from Dr Chris O'Donnell, a diagnostic radiologist working at the Victorian Institute of Forensic Medicine.

6. Sadly, Mrs Diane Ross did not live to see the Inquest process in action as she died prior to its commencement. Her daughter, April, attended court each day and was invited to ask questions of witnesses via Leading Senior Constable Cristiano, who assisted me, and also made an oral submission at the conclusion of the evidence.

7. Following the conclusion of the evidence and after receiving the transcript of proceedings, Counsel representing the various parties were invited to make written submissions and did so. I propose now to deal with each of the principal questions raised on behalf of Mr Ross' family.

A. Was pericardiocentesis warranted in the circumstances?

8. The answer to this question is essentially an exercise in risk-benefit analysis. Mr Ross was a challenging patient in that he had a significantly distorted thorax. He had had a total left pneumonectomy for lung cancer nine years before in 2000 (followed by radiotherapy). This had resulted in his heart shifting to the left and had caused the right lung to expand and shift towards the left. As a further consequence, Mr Ross' ribs on the left side were clustered together and he had fibrotic tissue in the space where the left lung had been. Chronic obstructive airways disease had caused his remaining lung and diaphragm to be elevated.[1] The autopsy confirmed artefactual evidence of cardiomyopathy, which the pathologist involved, Dr Paul Bedford, described as "*widespread interstitial fibrosis of the left ventricle*". This latter feature, Dr Bedford told the court, is a known substrate for cardiac arrhythmia and sudden cardiac death.[2] Mr Ross also had a history of "*symptomatic sick sinus syndrome aggravated by beta blockers requiring dual chamber permanent pacemaker implantation*".[3]

9. Due to these complicating features, I believe it can be reasonably stated that undergoing CT guided pericardiocentesis represented a significant risk and should only have been attempted in an emergency situation. Ballarat Health at the time did not have a catheter laboratory. This effectively ruled out pericardiocentesis using ultrasound being performed by a cardiologist. There was no evidence that any consideration was given to the procedure being performed surgically.

10. Witnesses differed on whether the decision to perform drainage should primarily be made on clinical grounds assisted by echocardiography or the reverse; on whether Dr Oqueli should

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[1] See evidence of Dr Manish Mittal -Transcript P. 167

[2] See Transcript P. 24 Lines 2-5.

[3] See Letter of Dr Hemant Chaudhary dated 25th July 2011 addressed to Coroners Court. Exhibit K.

have consulted Dr Chaudhary, Mr Ross' regular cardiologist; and on whether the clinical features combined with the echo film actually amounted to evidence of tamponade warranting urgent drainage.

11. The court had access to the medical records of BHS and the echo film taken on the 28th October 2009, all of which were available to the medical witnesses.

Assessment of Clinical Condition

12. An assessment at this time of Mr Ross' clinical condition when he presented to Ballarat Health on the 28th October is complicated by the differing views advanced by various medical witnesses. I also have to have regard to the not-insignificant concern expressed by Mr Ross' widow, Diane Ross, to the effect that on that day, her husband's condition was no different from usual. Mr Ross attended at the hospital for an echo ahead of his arranged appointment with his regular cardiologist, Dr Chaudhary, the following week, not for treatment or because of any need for acute symptomatic relief. This was at the recommendation of his General Pracitioner, Dr Obi. This fact was apparently not appreciated by a number of witnesses. Dr Christabel Kelly, the cardiology registrar, wrote in her notes "*HOPC - (history of presenting complaint)... and then lists "several months of increased shortness of breath...*";[4] Dr Mittal told the court that when he spoke with Mr Ross in the course of obtaining his consent, Mr Ross said "*they had found some fluid around his heart*". Dr Mittal believed "*it was the first presentation with pericardial effusion...*"[5] He wasn't told that Mr Ross had come to the hospital for a routine echo and was due to see his cardiologist in a couple of weeks.[6] Indeed, in his statement (Exhibit C) Dr Mittal said that "*the patient was transferred from Stawell Hospital to BHS after detection of fluid in the pericardium*". Mr Ross had, indeed, been a recent patient at Stawell Hospital for a chest infection but had been discharged home on 23rd October after making a good recovery.[7]

13. The submissions on behalf of BHS / Dr Oqueli and on behalf of Dr Meakin, at the conclusion of the evidence, differed in their categorization of the presentation. Mr Wallis for BHS / Dr Oqueli, in his submission, argued that, in fact, the presentation was not for a "routine echocardiogram" and referred to evidence by Dr Obi that "*he wanted to be sure that Mr Ross' cardiac ailment wasn't responsible for his respiratory decompensation.*" (Dr Obi then went

[4] Dr Kelly was not able to be called as a witness as she is currently residing in Ireland.

[5] See Transcript P. 83.

[6] Transcript P84 Lines 17-21.

[7] Statement of Dr Obi. Exhibit B

on "*so we wanted to get things in order for a more efficient review by his cardiologist when that took place*").[8] Ms Ellis for Dr Meakin argued in her submission that the echo was recommended by Dr Obi not because Mr Ross had any symptoms of concern but as part of the preparation for Mr Ross' appointment with Dr Chaudhary."[9] Dr Obi told the court that Dr Kelly was quite short with him on the phone and had insinuated quite forcefully that he had neglected Mr Ross in that he had "no plan" to deal with his condition.[10] Given that Dr Kelly phoned Dr Obi on instructions from Dr Oqueli, it makes no sense that she would be so critical of him if, indeed, Mr Ross had gone to BHS specifically for the investigation of some concerning symptoms, as suggested by Mr Wallis. In the circumstances, I consider it is reasonable to categorise the visit to BHS as being for a "*routine investigation ahead of his appointment with Dr Chaudhary*". According to Mrs Ross' statement, this appointment had been fixed for the 4th November, 2009, exactly one week later.

14. Mr Alexander Rosalion, a Cardio-Thoracic Surgeon of twenty years experience and a member of the Medico-Legal Section of the Royal Australasian College of Surgeons with extensive experience in examining medico-legal cases and providing reports, was very critical of the hospital notes.[11] He stated, "*There was a paucity of actual examination findings in the medical notes*".[12]

15. A review of the medical records contains much that is of concern. Dr Oqueli made no notes of his clinical examination either contemporaneously or even soon afterwards. He told the court that Mr Ross had presented as severely short of breath and very unwell.[13] Dr Kelly, the cardiology registrar, who conducted a clinical examination shortly afterwards on the direction of Dr Oqueli, in her notes states: "*O/E (on examination) - Well*". This is consistent with Mrs Ross' statement to Dr Mittal, the radiologist. He gave evidence that Mrs Ross told him whilst he was obtaining the consent that, "*he (Mr Ross) didn't look that unwell*". Dr Oqueli told the court "*It's not uncommon that family members of sick patient often underestimates (sic) the symptoms because they are used to the symptoms. It happens to us all the time*". Mrs Ross in her statement said that Mr Ross and she had walked some 500 metres from where they parked

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[8] Transcript P.33.

[9] Transcript P 40.

[10] Transcript P. 40

[11] Mr Rosalion had been engaged by solicitors who formerly acted on behalf of Diane Ross, but ceased to so act after her death. He was called as a witness on the basis of his statement that had already been provided to the Coroners Court.

[12] Transcript P. 547

[13] Transcript P. 362 Lines 14-15

the car outside the hospital; that Mr Ross had walked this distance without difficulty; that "*he had some shortness of breath but that was normal for him due to his cardiomyopathy*".[14] [15] According to Dr Oqueli's retrospective notes (made at 7 PM on 28/10/2009 -29 minutes after resuscitation ceased), Mr Ross had been "*unable to walk more than 20-30 metres due to dyspnoea*" at the time of his clinical examination. Dr Oqueli accorded significant importance to his clinical findings as he told the Court that he was not convinced on the echo that that "was enough reason to give him the shortness of breath that (he) was seeing at that time." The latter he described as occurring "*while sitting there and when he moved from the bed to the door of the room where we were.*"[16] Of course, it is very difficult to reconcile these conflicting accounts. Dr Mittal also observed that Mr Ross was "*short of breath, even with oxygen, while on the CT table for the procedure*".[17] In evidence, Dr Mittal told the court that he discussed the breathlessness with Mr Ross and with his wife. Mrs Ross had commented "*he has been like this for a long time...*" [18]

16. Whilst Mrs Ross could not be cross-examined on her statement about how she assessed her husband's condition on the 28th October 2009, I am not prepared to discount it, particularly as she has consistently maintained over the years that her husband's condition on the day of presentation to Ballarat Health was no worse than usual. Dr Oqueli's evidence, that families of sick patients often under-estimate deterioration as they have become accustomed to seeing the patient's poor condition, is contrary to evidence I have frequently heard in this Court by physicians who state that close family members should always be listened to as they are in tune with the patient's situation and are able to detect any deterioration.

17. Professor Richard Harper, who gave evidence as an independent expert on behalf of BHS, when asked about the fact that only the day before Mr Ross had played bowls and that he had walked some distance to the hospital on the day of his echo, told the court "*I'm in a difficult situation having not seen the patient at any stage but it seems to me that something was occurring very rapidly and that's .....why people die from tamponade, that things do occur rapidly.*"[19] Again, this is difficult to reconcile with the course of events on the day or with Mrs

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[14] Statement of Diane Ross – Inquest Brief P. 18.1 at 18.2.

[15] In an early letter sent to the Coroners Court, Mrs Ross said that they had parked opposite the rooms of Dr Kimpton. Dr Kimpton is at 10 Drummond Street South. – a distance from the hospital address of 270 metres.

[16] Transcript P. 288-289.

[17] Transcript P. 183 Lines 30-31.

[18] Transcript P.202 Lines 19-27.

[19] Transcript P 672.

Ross' comments to Dr Mittal to the effect that her husband looked no worse than usual. One would expect, a fortiori, that she would have noticed a *rapid* deterioration in her husband's state.

18. The shortness of breath described above by Drs Oqueli and Mittal, did not overly concern Mr Rosalion who told the court that whilst shortness of breath may be a very important symptom of tamponade, it is also "*a symptom from daily life - not from lying a patient on a CT bed. I don't think it has any meaning...One can become breathless over a very short period of time*".[20] He said that once you have a chest infection, even once you are over an acute chest infection, you may have some symptoms of shortness of breath for a considerable period of time. This is particularly so in someone who has had a pneumonectomy. He said "*it doesn't take too much embarrassment of your respiratory function to give you shortness of breath.*" He said that part of Mr Ross' shortness of breath was, according to the records of Stawell Hospital from which he had recently been discharged, due to cardiac failure which they felt was secondary to the chest infection and this may have been contributing to his shortness of breath.

19. A significant finding referred to by Dr Oqueli in his retrospective notes and not referred to elsewhere in the hospital records is the finding that Mr Ross had pulsus paradoxus, which the court was told was a strong indicator of cardiac tamponade. In those notes made in October 2009, Dr Oqueli described "*approximately* 10 mls of mercury drop in systolic blood pressure during inspiration." In oral evidence in February 2014, nearly 4 ½ years later, he amended the statement, before formally adopting it, so that the word "*approximately*" was now to read "*at least*". Then, under cross-examination by his own Counsel, he told the court that when he measured it, he "found that he was having *between 10 and 15 millimetres* of mercury of that paradoxical pulse.[21] According to both Mr Rosalion and Professor Harper, pulsus paradoxus is strongly diagnostic of tamponade. (The other features: shortness of breath, even with a clear lung, high pulse rate, low blood pressure, raised jugular venous pressure can all be signs of other things as well).

20. Mr Rosalion, basing his opinion on the hospital records (and therefore the retrospective notes of Dr Oqueli), did not consider the recorded drop of 10 millimetres of *mercury during inspiration as being a very large "respiratory swing" - "probably just above normal*" and that

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[20] Transcript P. 541.

[21] Transcript P 290. Lines 1-3.

you would expect more of a swing in "*full blown tamponade*".[22] Clearly then, the precise measurement is critical to diagnosis and yet, Dr Oqueli's evidence of the measurement evolved from "*approximately 10 mls*" to "*at least 10 mls*" and then to "*between 10 and 15 mls*" of mercury - the latter measurement four and a half years later.

21. Furthermore, Mr Rosalion told the court that the most reliable way to measure respiratory swing or pulsus paradoxus is by putting in an arterial line, rather than by cuff measurement. Dr Chaudhary told the court that pulsus paradoxus is "*generally the only reliable clinical sign of a haemodynamically significant pericardial effusion resulting in cardiac tamponade*". He went on to say that it is 'not routinely checked unless there is echocardiographic evidence suggesting compression of the right ventricle or the right atrium by fluid"; that it is not an easy clinical sign to pick up, "*especially using the cuff*".[23] There is no evidence that an arterial line was inserted. Dr Kelly did not even record the blood pressure reading in the progress notes, let alone note any suggestion that it evidenced pulsus paradoxus. This is curious, given that, according to Dr Oqueli, he discussed his clinical findings with Dr Kelly.[24] I consider it is not possible to attach any significant weight to Dr Oqueli's evidence in this regard.

22. Another area of confusion in relation to clinical findings is found in Dr Oqueli's oral evidence in which he stated that Mr Ross had good air entry in the remaining lung, which helped to persuade him that cardiac failure was not the cause of the shortness of breath he was observing. Dr Kelly in her clinical notes recorded that Mr Ross had reduced air entry left field (sic). The reference to the left lung, one can assume is an error as above that entry, Dr Kelly had written that Mr Ross had had a left lung resectomy.[25]

Interpretation of Echo Findings

23. Moving on from the clinical findings to the interpretation of the echo findings, again there was disagreement amongst the witnesses. Mr Rosalion was of the view that no diagnosis of cardiac tamponade could be made based on the echo taken on the 28th October, 2009 without a knowledge of the history of effusion in the past. According to the history maintained by Dr Chaudhary, Mr Ross had presented with radiological and echocardiographic evidence of pericardial effusion since 2001. It had been reported on each occasion except on the last echo organised by Dr Chaudhary. He told the court that on the last echocardiograph in March

[22] Transcript P. 544.

[23] Transcript P. 653 Lines 5-17.

[24] Transcript P. 291.

[25] I note that, similarly, the autopsy report refers to removing tissue from the "left lung" for histological examination.

2009, the effusion was so small it was not even mentioned in the report. Further, that investigation was mainly to follow up on Mr Ross' left ventricular function from cardiomyopathy. He was keeping an eye on the effusion since it was first noted.[26] Mr Rosalion told the court that:

> *"if you have any pericardial effusion that builds up over time, the pressure in the pericardium may not be as high because the pericardium can gradually stretch than if an effusion builds up suddenly when it does not have time to stretch and so that the measured pressures in the pericardium can be lower or higher, but to cause tamponade, the pressures in the fluid have to be high enough to restrict the functioning of the cardiac chambers and because the cardiac chambers on the right of the heart – so the right atrium and right ventricle normally work at a lower pressure they usually get compromised before the left ventricle which is generating higher pressure of its own".*[27]

24. Mr Rosalion was not convinced that Mr Ross had tamponade at all. He said that a degree of tamponade can develop over many months where the pericardium accommodates it to a certain extent. He said:

> *"One of my concerns (is) that the two pictures do not fully fit, in that he was sent to Ballarat as an elective echo. He apparently walked there but was then found to be a bit breathless, that the echo was elective but – it doesn't quite gel to me as to the true urgency of the situation particularly in somebody who's had a very longstanding pericardial effusion over many years".*[28]

25. Dr Oqueli reported (in his echo report on the 28th October) that there was "*severe pericardial effusion with echocardiographic signs of haemodynamic compromise. Pericardial effusion reaches 3.0 cm at the right atrial posterior wall level, 1.09 cm at the level of the right ventricular free wall and 2.3 cm at the level of the left ventricular lateral wall.*" In evidence, he said that the effusion was "*loculated*" or "*regional*" and the circumferential effusion was not necessary to a diagnosis of tamponade in a man with only one lung.

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[26] Transcript P. 642.

[27] Transcript P. 542 Lines 8-26.

[28] Transcript P. 580 Lines 10-17.

26. Dr Chaudhary disagreed with Dr Oqueli's report after viewing the echo film.[29] He told the court that he would normally require unequivocal evidence of cardiac tamponade before proceeding onto draining the fluid urgently. He would require evidence of right atrial and /or ventricular collapse to satisfy him that the patient is haemodynamically compromised.[30] He stated that he saw no evidence of right ventricular diastolic collapse on the echocardiogram, or of left atrial systolic collapse.

27. Professor Harper had not seen the film prior to writing his report. He viewed it prior to entering the witness box. In evidence he said, "*no doubt there's a substantial effusion and it does look as if the heart is under strain, in particular there is evidence of some compression of the right atrial and right ventricular chambers. Clinical tamponade is a clinical diagnosis, the echo doesn't tell you, the echo tells you that tamponade is possible, that this is a setting where tamponade may be present but it's a clinical diagnosis.*"[31] This opinion reflects that of Dr Oqueli who, as I have said, was not prepared to rely on the echo result alone.

Should Dr Chaudhary have been consulted?

28. In her statement, Mrs Ross said:

> *"Neville asked Dr Oqueli to speak to Dr Chaudhary to get his case history, but Dr Oqueli did not seem interested in doing that."*[32]

In his initial statement for the Coroner, Dr Chaudhary commented that as Mr Ross had been his patient and he had been monitoring his pericardial effusion over a period of time, he would have expected to be consulted regarding his previous clinical and echocardiographic data. Consequently, when statements were first sought from various witnesses, Dr Oqueli was specifically asked to comment on Dr Chaudhary's statement in that regard. On this point, Dr Oqueli, in his answering statement dated 22nd May, 2013, said only that he found Dr Chaudhary's comment "*curious*".[33]

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[29] Dr Chaudhary's expertise was challenged in what can only be described as a humiliating way by raising a totally unrelated issue vis-a- vis his restrictions on performing angiography at St John of God Hospital arising out of allegations of "over-servicing". This was unwarranted and in no way challenged his expertise in the areas of relevance to this inquest. At most, it was an attack on his credit and his credit was not in issue as he was not involved in any of the events of the day.

[30] Transcript P. 639.

[31] Transcript P. 665.

[32] Statement of Diane Ross made 4th August 2013. Inquest Brief P. 18.1 at 18.2.

[33] Statement of Dr Oqueli – Exhibit F 1.

29. Mr Rosalion totally supported the position taken by Dr Chaudhary and in his statement, adopted in evidence, said

> *"I feel it was essential to contact Dr Chaudhary prior to commencing an invasive procedure on Mr Ross unless it was an emergency which was not the case. It was clear that Dr Chaudhary had been following Mr Ross for many years and Mr Ross made it clear to the treating physicians that he had been previously known to have had a pericardial effusion which was being followed. It would thus have been essential to obtain all the previous information on Mr Ross which would most readily have been obtained by discussions with Dr Chaudhary."*[34] (Professor Harper, unfortunately, was not asked to comment on this.)

30. In oral evidence, Dr Oqueli introduced new material, which had not been proffered to the Coroners Court in May 2013, when he responded to Dr Chaudhary's comment that he would have expected to be contacted about Mr Ross' past history. At the inquest, he told the court that he did not recall being told by the patient or by Mrs Ross that the fluid had been there for a number of years and that Dr Chaudhary was aware of it (as alleged in her statement by Mrs Ross). He said that Mrs Ross had said when they were introduced: "*You are the doctor that he is going to be referred to. We don't want any relation with Mr Chaudhary or Dr Chaudhary*" and "before she and he going to Emergency, I ask her "*Do you want me to contact Dr Chaudhary?*" and she say "*No. You're in charge.*" It is curious that Dr Oqueli did not mention this conversation when responding to the early criticism that he had failed to contact Dr Chaudhary. Mrs Ross, of course, is now unable to contradict it, but, in view of her statement, it is likely that she would have done so. It was noted in the first letter she wrote to the Coroners Court in November, 2009 that her husband hard urged consultation with Dr Chaudhary and later repeated in her formal Statement some years later.

Evidence of urgency in BHS response

31. All medical witnesses agreed that acute onset cardiac tamponade represents a medical emergency. Accordingly, in assessing whether indeed this was the diagnosis, evidence of the response of the hospital in scheduling the procedure is critical. This is another area in which the evidence was confusing.

32. Dr Kelly advised Dr Mittal that the drainage could be done, "*if not today then definitely by tomorrow*". In evidence, he stated that she had told him that at that time all his "*vitals*" were

[34] See Statement of Mr Rosalion IB P94 at P 100.

maintained, which he took to mean "*blood pressure, heart rate and general condition of the patient*".[35] Clearly, any real urgency was either not communicated to Dr Kelly by Dr Oqueli, or she underestimated it, which, of course, is consistent with her describing Mr Ross as looking "*well*" on examination. In a report (undated) to ICU at BHS after the death, Dr Mittal wrote that the Cardiology Registrar Dr Kelly had requested pericardial drainage on Mr Ross who had some features of dysfunction, particularly of the right heart. *"She stated that though the drainage was not urgent, it needed to be done within one to two days and she was arranging a bed for the patient*".[36] Dr Mittal, in the entry in the notes he made shortly after Mr Ross died, said that when he was taking the consent, he had explained to the patient "*that presently the functions are not remarkably bad but the procedure was planned more to avoid the situation becoming worse and also to send out fluid to assess why it was accumulating*".

33. It is difficult to reconcile these remarks with the opinion expressed by Professor Richard Harper that "*it would not have been appropriate to transfer Mr Ross to a metropolitan tertiary hospital. Very likely if this had been done he would have died during the ambulance trip*".[37] The road trip to Melbourne takes an hour and a quarter. With an ambulance on Code 1, it would take significantly less. In the event, the drainage procedure did not start for another three hours or so. On the one hand, what is being described by the practitioners "on the ground"- who are taking direction from Dr Oqueli - (that is: Drs Mittal and Kelly) - is, at most, an urgent procedure. Professor Harper is describing an *emergency*, relying principally on the clinical observations made by Dr Oqueli, which he recorded in the notes after the death.

34. Professor Harper [relying on the evidence of Dr Oqueli that there was strong clinical evidence of tamponade] said that had this happened at Monash Medical Centre, the patient would have been up in a cath lab and "*we would attempt to drain the effusion as quickly as possible*". He said "*if the cath lab wasn't free within a period of 10 - 15 minutes, then we would attempt to drain it somewhere else*". There is no sense of urgency to this degree recorded in the notes or in the evidence as being the case at BHS. Nobody approached the radiology department to interpose Mr Ross' procedure, which, one would imagine, would have been done were Mr Ross at risk of sudden death. Dr Mittal took it upon himself to ask staff to stay behind after the scheduled patient list had been completed.

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[35] See evidence of Dr Mittal Transcript P. 73. (Notwithstanding this, Dr Mittal made arrangements for technicians to stay back so that the procedure could be performed that afternoon).

[36] See Inquest Brief p.82.

[37] Statement of Professor Richard Harper. Exhibit L.

Drainage for Diagnostic Purposes

35. It is clear that Dr Oqueli took a view based on his clinical findings that Mr Ross required pericardial drainage, both therapeutically and diagnostically. Dr Rosalion takes issue, as I have said, with the first assessment. He also disputes the need for the procedure to be performed to allow diagnostic testing, in view of the length of time since the carcinoma was removed and the thorough post-pneumonectomy testing conducted at the Alfred Hospital, which had ruled out further malignancy. Furthermore, he told the court that most pericardial effusions that are malignant are not diagnosed by analysis of aspirated fluid but by biopsy. He said that less than 30% of true malignant pericardial effusions actually have positive cytology.[38] He had, however, no objection to the principal of having the fluid sent off for testing.

Responsibility for decision to perform pericardiocentesis at BHS

36. I am satisfied that, of the specialities of the doctors involved in Mr Ross' case on that day, the diagnosis of cardiac tamponade was one that could only have been made by the cardiologist involved. In the circumstances, the decision to proceed to pericardial drainage was entirely the responsibility of Dr Oqueli. Dr Meakin told the court that as a radiologist he was not in a position to assess or interpret an echocardiogram; that he was not in a position to assess the clinical signs of tamponade or to challenge the assessment made by a cardiologist.[39]

Conclusions

37. Dr Rosalion presented a compelling case to support the position that this was not an emergency situation requiring urgent drainage. Whilst he accepted that the clinical features described by Dr Oqueli would be relevant to such a diagnosis, he said that these were capable of other interpretations. He noted that these features were described only in notes recorded after the death and he could find no contemporaneous notes of Dr Oqueli in the hospital file.[40] It is noted that Dr Oqueli's notes differed from the contemporaneous notes made by the only other doctor who performed a clinical examination, Dr Kelly. In particular, Dr Kelly noted

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[38] Transcript P. 588.

[39] Transcript P. 464 Lines 1-11.

[40] Mr Rosalion was asked, inappropriately in my view, as there was no evidence that he was familiar with Dr Oqueli in any other context, whether he was "suggesting anything towards the integrity of Associate Professor Oqueli" to which Mr Rosalion responded that he was not sure how much Dr Oqueli could have remembered some hours later. Transcript P 575.

that on examination Mr Ross was '*well*". In evidence, Dr Oqueli told the court that Dr Kelly was "*under my direct supervision*" and, as noted in paragraph 21 above, he had discussed the clinical findings with her.

38. I accept Mr Rosalion's opinion that Dr Chaudhary should have been consulted before this major decision was made. It is very likely, based on Dr Chaudhary's evidence to the inquest, that he would not have agreed with the proposed drainage. Had this been the case, then, based on Mrs Ross' statement, it is likely that Mr and Mrs Ross would have preferred Dr Chaudhary's advice, given that they did not consider that Mr Ross was unusually unwell, and the procedure would not have been consented to. I accept Mr Rosalion's view that he expressed as being "*without a doubt*" that "*had Mr Ross' situation been handled differently, there is a strong possibility that his death could have been avoided.*"[41]

39. I am not satisfied that Mr Ross' clinical condition was sufficiently concerning, when balanced against the risks posed by CT guided pericardiocentesis, to proceed down that path

B. Was pericardiocentesis performed in a manner that was safe?

40. The second issue revolves around the manner in which the pericardocentesis was performed. Dr Rosalion was of the firm view that even if drainage had been warranted, it should not have been done percutaneously, as here. He said that whichever way you did it, it was going to be fraught with difficulty. Dr Thompson, diagnostic and interventional radiologist, told the court that whilst most pericardial collections were drained by the cardiologist who performed the echo, in this case, the anatomy was markedly distorted which made echo imaging difficult. I have already said that Dr Harper told the court that at his hospital in Melbourne, the procedure would have been performed by a cardiologist using ultrasound.

41. The drainage was performed by Dr Manish Mittal, Radiologist, using CT guided needle technique. I am satisfied that this method is a recognised way of performing the task and that it is not uncommonly performed this way in appropriate cases. Dr Mittal had significant experience in CT guided drainage generally. He had, however, performed *pericardial* drainage using this technique on only three occasions in his career as a specialist radiologist since 2007. Dr Alex Meakin, who provided advice and assistance to him during the procedure, had performed only 4 or 5 such procedures since his admission to Fellowship of the Royal Australian and New Zealand College of Radiology in 2003. (He also had a history of performing CT guided drainage generally on a frequent basis). He told the court that he

[41] See Statement of Dr Rosalion P102 Inquest Brief.

had performed only one pericardial drainage since this event in 2009. There was general agreement that if the procedure had to be performed, it should be performed by the most senior and experienced practitioner. There is no evidence as to whether there were radiologists more experienced in this procedure in Ballarat who could have been asked to assist or whether any enquiry was made along these lines.

42. In terms of the actual mechanics of the procedure and who was in charge, notes in the hospital file created a different impression from the sworn evidence. Dr Mittal's notes, written shortly after Mr Ross' demise, give the strong suggestion that his preferred angle of approach had been overridden by Dr Meakin, whom he described as his "*supervisor*"; that he had wanted to take the sub-xiphoid approach but Dr Meakin wanted to take the "*left anterior chest wall oblique approach*". Planning scans were taken and once the procedure commenced scans were taken at frequent intervals and checked on the monitor behind the console in the same room. At a certain point, Dr Mittal records, he *"hesitated to go further but Dr Alex insisted that if I go further I will hit the fluid.....Two further series of scans with needle slightly pushed inside ... and I told that I am not happy to push the needle further as I believed there was no fluid in the region. Dr Alex however asked to direct it further by a few mms which I did and re-obtained scans but I felt that I could not go further and therefore I withdrew the needle. The patient complained of passing out and I immediately called the MET response...."*[42]

43. In evidence, Dr Mittal completely resiled from any suggestion that Dr Meakin was "*supervising*" him; that Dr Meakin had "insisted" on a particular course or that there had been any discord between them in respect of the approach to take.[43] He drew the analogy of two pilots in a plane. He said the angle of approach was a matter of discussion between them and he ultimately acceded to the suggestion of Dr Meakin to adopt the left parasternal approach. It had always been his, Dr Mittal's, decision to make.

44. In the course of their discussion, positions were advanced as to the advantages and disadvantages of the respective approaches. The effusion was "non-circumferential". It was variously described by witnesses who looked at the images as being "*loculated*" or "*regional*". During the planning stage, the patient was moved from supine to left and to the right. This made little difference. With Mr Ross on his right side, the thickness of the pocket increased from 1.1 cm to 1.7 cm so this was the way in which it was decided to position him for the

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[42] Inquest Brief P. 79.

[43] The explanation he gave to the court was that at the time he was still distressed from Mr Ross' death when he wrote his notes and before he had had time to assimilate and absorb what had happened.

procedure. Both radiologists agreed that the only two viable routes were via the sub-xiphoid approach or via the left parasternal approach.

45. The sub-xiphoid approach was on target to capture the largest pocket of fluid which was to the left side and back of the heart. However, it required a long needle and only the tip of the needle would have been visible on the scanned images; the longer the needle, the less the control in terms of manoeuvring the tip; the course of the manoeuvring of the needle was complicated by the need to avoid certain organs such as the liver and colon on the way to the pocket of fluid. The left parasternal approach was a shorter distance, requiring a much shorter needle, and provided more direct access. The whole of the needle and its shadow could be visualised on the scans. The needle would be entering the pericardial sac obliquely, tangentially to the wall of the ventricle. It was posited that it was therefore less likely to indent the ventricle or come into contact with the surface of the ventricle. However, it was targeting a much smaller quantity of fluid, which, as it turned out in the course of the procedure, reduced significantly due to gravity and patient movement. As part of the "*planning*" phase, it had been felt that that the problem of a smaller collection was not irresolvable, as, once positioned in the pericardial sac, a soft and flexible catheter could be threaded onto a guide wire and manoeuvred, without risk, towards the larger pocket of fluid. However, in the event, the collection aimed for reduced from 1.3 - 1.4 cms at 5.37 PM to 0.9cm at 5.50 PM to 1 cm at 5.52 PM to 6mm at 5.54 PM to 4 mm at 5.56 PM when the needle was withdrawn. The needle thickness was 1.2 mms.

46. The reducing pocket made the risk of perforation of the heart muscle surface greater, taking into account the movements of the heart and the chest, the need to take still images, leaving the patient in situ whilst reviewing them on the console on the other side of the room; and, generally, the challenge of performing a three-dimensional procedure relying on two-dimensional images. Mr Rosalion, whilst professing that he was in "*awe*" of the skills of radiologists who perform CT guided drainage, expressed the opinion that, in this case, this approach posed far too many risks. Had the procedure been necessary, (which, as I have said, he disputed), the best way to have performed it would have been by surgery with local anaesthetic via the sub-xiphoid approach. Mr Rosalion was familiar with that procedure. He told the court that he performed about five per month. At the very least, if the percutaneous method were adopted, surgical back up should have been available.[44]

[44] Dr Thompson disagreed with this as being "an outmoded concept". In the event, I do not consider I have to resolve this conflict as it is not clear that surgical backup would have affected the outcome in the circumstances.

47. Mr Rosalion said that the only place to put the needle is where the fluid is or where the fluid is thickest and it was not in the anterior position. Other organs are of lesser issue- the length of the needle and the length of the path are considerations, but in his view, the main criteria for safeness is to put the needle where the main thickness of the fluid is, as originally planned by Dr Mittal.[45]

48. I have some sympathy for Drs Mittal and Meakin and the position they found themselves in. They were not in a position to challenge the diagnosis or the plan. (Whilst Dr O'Donnell told the court that in their position, he would be talking to the cardiologist, to make sure this potentially risky procedure was still necessary, personalities and self-confidence come into these things). They were dealt an incredibly difficult hand. If there was tension between them as suggested by Dr Mittal's nearly contemporaneous notes, (and I am unable to decide with any certainty just how much, if at all, they reflected the actual position), this was brought about by a very difficult situation outside their control. Dr Mittal told the court that he was going to attempt the drainage only once and, if this did not work, he was going to refer the matter back to Dr Oqueli and recommend surgical drainage. This is another factor that raises concerns about their level of collaboration at the time as this was apparently news to Dr Meakin.[46]

49. In any event, as I have said, upon withdrawal of the needle, Mr Ross complained of feeling unwell and soon went into cardiac arrest. I am satisfied that it was not a case of cardiac arrhythmia which, according to all the evidence, would not result in symptoms emerging a few minutes after withdrawal of the needle as apparently happened here.

50. Significantly, in evidence, Drs Mittal and Meakin disagreed about the location of the needle tip on the last occasion on which it was moved forward. Dr Mittal told the court that it was in the epicardial fat from where it could do no damage. Dr Meakin considered that it had penetrated the pericardial sac and was indenting the surface of the right ventricular wall. At first he said that he did not believe it had penetrated the surface. He subsequently said "*I couldn't say that it hasn't penetrated a short distance into the wall*".[47] He was, however, very confident that it had not penetrated the lumen – which would have caused a jet of blood through the needle. Dr Meakin told the court that Mr Ross suffered from cardiomyopathy and that this probably led to wall thinning "*so maybe there was an elevated risk of*

[45] Transcript P 601

[46] Transcript P.521.

[47] Transcript P 484 Lines 15-16.

haemopericardium...if the wall had been penetrated", but added that it was not his area of expertise.[48] Mr Rosalion told the court that the right ventricle is extremely thin. He said that it is very hard to actually even see a hole that is made. He said you would not see the blood coming out on a CT scan until a significant amount of blood had issued. [49] He said that in his experience, when clinically it has been known that the right ventricle has been torn, at the subsequent post-mortem examination that hole, which was *known* to be there, has not been found. Dr O'Donnell gave evidence after viewing the scans that it was possible that the needle had penetrated the ventricular wall but he could not say for certain that it had. Looking at the scans, he told the court "*I can't tell you exactly what is happening when the heart is beating...the needle will be fixed, the heart is moving, so it's certainly possible that the needle is going in further. I can't tell you exactly where it is but the image that I see is at least on the anterior wall of the myocardium, possibly just into the myocardium.*"[50] The most likely explanation for Mr Ross' death is that he did, in fact, suffer an episode of cardiac tamponade brought on by penetration of the needle into the right ventricle wall (not into the lumen) with a consequential bleed into the pericardium.

COMMENTS

Pursuant to section 67(3) of the **Coroners Act 2008**, I make the following comments connected with the death:

51. This investigation was unusual in that the person advocating for it is now deceased herself and was unable to participate. I consider I am entitled to assign weight to Mrs Ross' statement notwithstanding she was unable to be cross-examined on it. Even in criminal proceedings, following amendments to the Evidence Act 2008 (Section 65), the hearsay rule has no application where a deponent is unavailable to give evidence, in circumstances in which the statement was made shortly after the asserted fact occurred and in circumstances that make it unlikely that the representation is a fabrication. In this respect, I have paid attention to the matters raised in Mrs Ross' formal statement that were contained in her first letter dated November 2009.

52. The critical parts of Mrs Ross' statement relate to her observations of her husband's condition and her request that Dr Chaudhary be contacted. Whilst, of course, she is not a clinician, from all the correspondence from Mrs Ross it is clear that she was very alert to her husband's health

[48] Transcript P. 508. Lines 10-17.

[49] Transcript P. 553.

[50] Transcript P. 221.

and well-being. She was familiar with his shortness of breath problems. There was no evidence that she had resisted his recent in-patient stay at Stawell hospital. I have no reason to doubt that she was being truthful when she stated that she had asked that Dr Chaudhary be consulted. On the other hand, as I have stated, Dr Oqueli's evidence on this score, which was so different from hers, came to light only after her death, notwithstanding he had the opportunity to advance this evidence earlier in response to a specific question from the Coroners Court in this regard. I assign greater weight to Mrs Ross' account.

53. Had Dr Oqueli made contemporaneous notes of his consultation with Mr Ross, or shortly thereafter, these inferences may well have been avoided, as would the concerns expressed by Mr Rosalion as to the weight that can be attached to the "retrospective" notes made by Dr Oqueli after the death. Even these notes make no reference to Mr Ross having a clear lung and this featuring in his assessment of whether cardiac failure could be the reason for the shortness of breath, a factor to which, in oral evidence, Dr Oqueli drew the court's particular attention. Medical practitioners are in a privileged position in that rarely does another practitioner criticise their *clinical* management and assessments, having regard to the fact that they were "*not present at the time of the consultation with the patient.*" Accordingly, the consistent concerns expressed by Mr Rosalion, whose objectivity was not questioned and who has experience in medico-legal matters, about the original diagnosis and management, were worthy of significant weight in my view. His evidence was given in a dispassionate and objective manner.

54. As I indicated earlier, I find it particularly concerning that following Mr Ross' demise, a call was made by the hospital to Dr Obi asking him to complete a death certificate. This was clearly a Coroners case and the hospital should have been alive to this. One wonders how Dr Obi was going to be in a position to certify as to the cause of death, given that he had not had any involvement with the events of that day other than forwarding the most recent radiology report. I note that Dr Obi's evidence was not challenged in this regard. Mrs Ross' statement corroborates this in that she stated that Dr Obi informed her about it when she phoned him later that night. Apart from stating that it was not Dr Kelly with whom he had spoken earlier, Dr Obi was not able to identify the female from the hospital who telephoned him with the request. **I consider that BHS should conduct an enquiry into the circumstances of the call made to Dr Obi to determine on whose authority the call was made.**

55. The only other matter I raise is that Dr Chaudhary should, in my view, have mentioned the extent or otherwise of the pericardial effusion in his last echo report made in March 2009.

The absence of any reference to it, given that it had been historically present and recorded, could be misleading to another practitioner reading it. This is clearly important given the evidence about the pericardium needing time to distend. Mr Rosalion told the court that "*if you have any pericardial effusion that builds up gradually over time, the pressure in the pericardium may not be as high because the pericardium can gradually stretch over time than if an effusion builds up suddenly*".[51] Had reliance been placed on the March echo report, the effusion noted on the 28th October, could be interpreted to be of recent origin, given the lack of any reference to it in Dr Chaudhary's report. (Of course, had there been contact with Dr Chaudhary, this history would have come to light).

I make no formal Recommendations.

I direct that a copy of this finding be provided to the following:

The Family of Neville Ross

To all interested parties

Dr Hemant Chaudhary

Signature:

JACINTA HEFFEY
CORONER
Date: 21st August 2014

Coroners Court of Victoria

[51] Transcript P 542.