CITATION: *Inquest into the death of Marilyn Lalara NTMC [2011] 027*

TITLE OF COURT:	Coroner's Court
JURISDICTION:	Groote Eylandt
FILE NO(s):	D0054/2010
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HEARING DATE(s):	24 - 25 May 2011
FINDING OF:	Mr Greg Cavanagh SM
CATCHWORDS:	**Unexpected Death, myocarditis, remote area health facilities and treatment, aero-medical evacuation**

REPRESENTATION:

Counsel:

Assisting:	Jodi Truman
Department of Health:	Sally Sievers

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IN THE CORONERS COURT
AT ALYANGULA IN THE NORTHERN
TERRITORY OF AUSTRALIA

No. D0054/2010

In the matter of an Inquest into the death of
MARILYN LALARA
ON 4 APRIL 2010
AT ALYANGULA CLINIC,
GROOTE EYLANDT

FINDINGS

Mr Greg Cavanagh SM

Introduction

1. Mrs Marilyn (Dumaberangergamia) Lalara was born on 7 September 1961 at what was then known as "Groote Eylandt Mission" on Groote Eylandt in the Northern Territory. She died on 4 April 2010 at the Alyangula Health Clinic. I note that during the proceedings a request was made by the family that for the purposes of the inquest, she be referred to as "M Lalara". In these findings I will refer to Mrs Lalara as "the deceased".

2. The cause of the deceased's death was found, following an autopsy, to be acute myocarditis which occurred as a result of a systemic viral infection. I heard evidence that myocarditis is an inflammation of the heart muscles. I received evidence that in the case of the deceased it is more likely than not that her heart produced an inflammatory response to the infection, which was in an attempt to fight off the infection. Unfortunately her heart was simply unable to fight off that infection, and her heart failed and she died.

3. At the time of her death, the deceased was in the care of staff at the Alyangula Health Clinic. She was in fact waiting to be evacuated by air to Gove Hospital. This was because the facilities at the Alyangula Clinic were not sufficient to adequately treat her symptoms.

4. Her death was unexpected and thus reportable to me pursuant to s.12 of the *Coroners Act*. The holding of a public inquest is not mandatory but was held as a matter of my discretion pursuant to s.15 of that Act.

Jurisdiction and Findings

5. Pursuant to s.34 of the Act, I am required to make the following findings:

> "(1) A Coroner investigating:
>
> a. A death shall, if possible, find:
>
> (i) The identity of the deceased person.
>
> (ii) The time and place of death.
>
> (iii) The cause of death.
>
> (iv) Particulars required to register the death under the *Births Deaths and Marriages Registration Act*.

6. I note that section 34(2) of the Act also provides that I may comment on a matter including public health or safety connected with the death being investigated. Additionally, I may make recommendations pursuant to section 35 as follows:

> "(1) A Coroner may report to the Attorney General on a death or disaster investigated by the Coroner.
>
> (2) A Coroner may make recommendations to the Attorney General on a matter, including public health or safety or the administration of justice connected with a death or disaster investigated by the Coroner.
>
> (3) A Coroner shall report to the Commissioner of police and Director of Public Prosecutions appointed under the Director of Public Prosecutions Act if the Coroner believes that a crime

may have been committed in connection with a death or disaster investigated by the Coroner"

7. Counsel assisting me at this Inquest was Ms Jodi Truman. Ms Sally Sievers was granted leave to appear on behalf of the Department of Health. I thank each Counsel for their extremely helpful assistance in this matter. I note that whilst the family of the deceased were advised of the inquest there were no family members in attendance.

The Conduct of the Inquest

8. A total of 7 witnesses gave evidence at the Inquest. Those persons were:

   a. Senior Constable Tyron Bellman, the Officer in Charge of the Coronial Investigation.

   b. Dr Terrence Sinton, Forensic Pathologist.

   c. Registered Nurse Jason Moore.

   d. Dr Clare Nowak.

   e. Registered Nurse Phillip Fato.

   f. Dr Karsten Ludwig.

   g. Dr Andrew Jamieson.

   h. Dr Didier Palmer.

9. A brief of evidence containing various statutory declarations from the family of the deceased, medical staff and police, together with numerous other reports, photographs, police documentation and medical records for the deceased, were tendered at the Inquest ("exhibit 1"). The death was investigated by Senior Constable Tyron Bellman, who prepared a thorough investigation brief and I thank him for his assistance.

Formal Findings

10. On the basis of the tendered material received, and oral evidence heard, at this Inquest I am able to make the following formal findings in relation to this death:

    i. The identity of the deceased person was Marilyn (Dumaberangergamia) Lalara born 7 September 1961 at Groote Eylandt in the Northern Territory of Australia.

    ii. The time and place of death was 4.10pm on 4 April 2010 at the Alyangula Health Clinic, Groote Eylandt.

    iii. The cause of death was acute myocarditis.

    iv. Particulars required to register the death:

        a. The deceased was a female.

        b. The deceased's name was Marilyn (Dumaberangergamia) Lalara.

        c. The deceased was of Aboriginal descent.

        d. The death was reported to the Coroner.

        e. A post mortem examination was carried out by Dr Terrence Sinton who confirmed the cause of death.

        f. At the time of her death the deceased was married to Andy Mamarika (now deceased).

        g. The deceased lived at Lot 227, Umbakumba Community, Groote Eylandt in the Northern Territory of Australia. She lived her entire life on Groote Eylandt.

        h. At the time of her death, the deceased was employed as a cook at the Women's Resource Centre, Umbakumba Community.

Circumstances Surrounding the Death

11. The deceased was a 48 year old Aboriginal woman. I received evidence (most particularly detailed in the medical records tendered before me) that the deceased had a long medical history with her records at Umbakumba Clinic dating back to 1994. In particular the deceased suffered from the following medical and chronic diseases:

    11.1 Diabetes Type 2;

    11.2 Chronic Obstructive Pulmonary Disease ("COPD");

    11.3 Ischaemic Heart Disease ("IHD") with a query as to Angina; and

    11.4 Kidney Disease (Renal Failure – Stage 1).

12. It is clear from the evidence that the deceased was being treated for these various conditions by way of numerous medications. Some of those medications addressed her diabetes. Others were for hypertension and kidney disease. In addition she was also taking aspirin for the prevention of cardiovascular disease and other medication for the treatment of asthma and COPD. It is also clear that the deceased was known to be non-compliant with her medications, which often led to complications. I heard evidence however that non-compliance with medication is often a problem with indigenous patients, particularly in remote areas. The deceased was also a heavy smoker and had been so for most of her life.

13. The medical records reveal that the deceased regularly attended the Umbakumba Clinic and it appears from perusal of those records that she would attend on an average of four to six times per month. I received evidence that this is also not unusual in remote communities. In the lead up to her death, the deceased in fact attended at the Umbakumba Clinic on 7 occasions in March 2010 and had attended at the clinic each day of the 3 days prior to her death.

14. Relevantly I received evidence from Registered Nurse ("RN") Jason Moore that he attended upon the deceased on 30 March 2010. RN Moore has been a registered nurse for the last 14 years and had been employed at Umbakumba Health Clinic for approximately 6 months from November 2009. RN Moore gave evidence that on 30 March 2010, the deceased came to the clinic with "a productive cough, similar to an upper respiratory tract infection". As a result, RN Moore determined that the deceased was suffering from a chest infection and provided her with antibiotics. It is to be noted that the deceased had in fact been diagnosed as suffering from a chest infection back on 10 March 2010.

15. The deceased was again seen by RN Moore on 31 March 2010. On this occasion it was after hours. Again the deceased complained of being unwell and of feeling feverish. Her respiratory rate was still very slightly elevated (as it had been the day prior) and there was a chest wheeze that was heard upon examination. RN Moore gave evidence that the deceased's vital signs were otherwise normal. RN Moore administered a nebuliser and antibiotics and made a note for a review to occur "in two days". He considered that because he had only seen her within the last 24 hours, "the chances of antibiotics and medication working that faster are very slim". A further note was made in the deceased's records that if there was no improvement by the time of review, then consideration would need to be given to the use of intravenous ("IV") antibiotics.

16. RN Moore gave evidence that his notation about IV antibiotics was an indication that he was concerned about the long standing nature of her chest infection and lack of improvement. He intended to review the deceased himself in 2 days' time but that did not occur. He was not aware (at the time) that coincidentally RN Phillip Fato in fact subsequently attended upon the deceased.

17. On 2 April 2010, the medical records show that the deceased again attended at the clinic. On this occasion she was seen by RN Fato, who has been a registered nurse since 1996 and is currently employed at the Umbakumba Health Clinic having been employed there since 2009. RN Fato gave evidence before me and also provided a statement. In accordance with his evidence, and the medical records themselves, RN Fato saw the deceased at 7.30pm that day and she complained to him of a sharp pain on her right chest when she coughed, vomiting, shortness of breath, feeling "funny", "hot" and had blood in her urine. RN Fato took her vital signs and it appears that she had a fever of 38C, slightly lowered oxygen saturation (but still in normal range) and that there was reduced air entry into the lower lobes of her lungs with wheeze. It was also noted that the pain in her chest was worse when coughing and she had yellow/green sputum. In terms of the blood in her urine, RN Fato gave evidence that the deceased informed him that she was menstruating on and off.

18. RN Fato was asked in evidence about the chest pain that the deceased was exhibiting and stated that in relation to this complaint he followed what he referred to as the "CARPA Manual". I understand this to be reference to the "Central Australian Rural Practitioners Association Standard Treatment Manual". RN Fato stated that in accordance with that manual, because the pain was sharp and only when the deceased coughed, he did not consider it was necessary to conduct an Electro-Cardio-Gram ("ECG"). RN Fato stated that had the pain been described as heavy and dull he would have undertaken an ECG, but because of the nature of the pain was described as "sharp" and the fact that the deceased also had a fever and her other symptoms, he assessed the deceased as having a continuing chest infection.

19. As a result, RN Fato decided to administer procaine penicillin to the deceased and administered the first of five days intramuscular penicillin. It was provided in this manner, because he discovered that the deceased had not been taking the oral antibiotics that had previously been prescribed

because she said they made her feel sick. RN Fato planned to review the deceased the next day.

20. On 3 April 2010, the deceased was again seen by RN Fato at about 11.30am for review and was given the second of her penicillin injections. RN Fato gave evidence that he took the deceased's vital signs and they had improved since the day prior. He noted that her haemoglobin ("HB") level was 81 and he attempted to find within the records an earlier recording of the HB levels for comparison. He stated that he was only able to find a record back in 2009 and because it was not recent he did not become too concerned by the HB level. Because the deceased's other signs appeared to be improving he again considered the diagnosis was chest infection and provided the deceased with her second penicillin injection, with a plan to review her the next day again.

21. RN Fato gave evidence that on 4 April 2010 he was on call and his plan was to attend upon the deceased at her home in order to conduct his review. RN Fato was also required to attend at the home of another patient and their residence was closer to his home. As a result he attended upon that patient first and discovered the patient needed conveyance to Alyangula to see the doctor there. As a result, he did not attend upon the deceased as planned.

22. I received evidence that on the morning of 4 April 2010 the deceased was very unwell. As a result, her daughter Annerita Mamarika went to the clinic to seek the assistance of the nurse. RN Moore gave evidence that although he was not on duty on that day, he was in fact on call and received a knock on the door at approximately 11.15am from Annerita who told him that the deceased was "feeling sick and weak". RN Moore stated that he went to the residence of the deceased and when he saw her she appeared unwell and short of breath. As a result he decided to take her to the clinic for assessment.

23. On the way to the clinic, RN Moore stated that the deceased was speaking with family, but was not answering his questions as to how she was feeling. RN Moore stated that this was not an unusual experience and he considered perhaps it was to do with a cultural issue. He therefore did not have a heightened concern about her failure to answer his questions.

24. RN Moore gave evidence that at the clinic, the deceased required assistance onto the bed for her examination. RN Moore took the deceased's vital signs. Her heart rate was 109, her rest rate was 26 which was consistent with her shortness of breath, her temperature was 36.7 degrees, her blood pressure was 134/84, and her oxygen saturation was 100%.

25. Because of her history of diabetes and being in renal stage one; RN Moore completed a blood sugar level ("BSL") test. I heard evidence that the machine limit for readings is 25 milimols ("mmols") and that his reading was un-recordable as it was higher than the machine limit. RN Moore gave evidence that a high BSL can be a cause for concern as it can mean a significant infection is taking place. RN Moore gave evidence (at p.25.6):

> "… if that's left untreated, then long term it causes damage to the internal organs. It can also account for her altered level of consciousness. So it's something that needs to be reviewed by a medical officer at that stage"

26. RN Moore stated that he noted the deceased's HB level of 81 in her records taken the night before by RN Fato. As a result, RN Moore re-checked the deceased's HB level and discovered it was now 55. Because of this dramatic drop in levels, RN Moore stated that he conducted the test again as he was unsure whether the machine was working correctly. On this occasion the HB level was 44. RN Moore stated that this drop from 81 to 44 caused him serious concern as to the deceased's status and he began attempting to ring the on-call doctor, Dr Clare Nowak who was in Alyangula.

27. RN Moore gave evidence that when he spoke to Dr Nowak he provided her with the deceased's history and sought approval to provide her with an insulin infusion and intravenous antibiotics. The insulin infusion was for blood sugar levels and the antibiotics were for the chest infection. RN Moore told Dr Nowak that he considered the deceased required an urgent medical review requiring her transportation to Alyangula. RN Moore stated that it was his understanding that a patient could not be air-med evacuated until they had been seen by a doctor.

28. Dr Nowak also gave evidence before me. Dr Nowak has been a qualified medical practitioner since 1986 and has practised both in England and Australia. I heard evidence that she has resided and worked at Groote Eylandt since January 2010, with such work requiring her to attend at numerous health clinics, being Alyangula, Angurugu, Umbakumba, Bickerton Island and Numbulwar.

29. Dr Nowak recalled the first telephone call that she received from RN Moore and gave evidence that after being advised of the deceased's history and the current observations, she formed the opinion that the deceased was too sick to be managed at Groote Eylandt because there were no "hospital facilities" and therefore she needed emergency air-med evacuation to the Gove Hospital. As a result, Dr Nowak stated that she made contact with the District Medical Officer ("DMO") at the Gove Hospital, namely Dr Karsten Ludwig to arrange for such an evacuation.

30. Dr Nowak gave evidence that she did this because an air-med evacuation cannot occur without approval and co-ordination of the DMO. Dr Nowak stated that she told the DMO of the deceased's circumstances and her opinion that an air-med evacuation was required. I had tendered into evidence before me a copy of the "Aerial Medical Service Telephone Consultation Record" (part of exhibit 4), which records that first phone

conversation between Dr Nowak and Dr Ludwig as occurring at 12.20pm on 4 April 2010.

31. Dr Nowak's evidence of that phone conversation was that she advised the DMO that she did not believe that the deceased could be treated on Groote Eylandt and needed evacuation. She recalled Dr Ludwig advising her to have the patient brought to Alyangula. She believed that this was consistent with the fact that a plane could not land at Umbakumba at that time because of the airstrip and that the deceased would need to be flown out of Alyangula. She recalled being told there was no plane at Gove but she did not recall ever being told that no plane would be tasked to attend. She believed a plane was to be tasked by the DMO, however she accepted that this had not actually been said to her, it was something that she had assumed.

32. Dr Ludwig also gave evidence before me. Dr Ludwig has been a medical practitioner since 1997 and registered since 1999. He has been employed at the Gove District Hospital most recently since April 2008 and was the DMO on 4 April 2010, commencing his shift at 8am and scheduled to finish at 8pm that day.

33. Dr Ludwig stated that when he commenced his shift he contacted Air-med Logistics inquiring about the status of planes available that day and was told that the pilot was sick, but may be available in an emergency. Dr Ludwig then made contact with the air-med nurse and was informed that the pilot was sick and not available for any trips. As a result there was no plane designated as available to Gove for the whole of the shift. Dr Ludwig made clear that this did not mean that there was no plane for any emergency, but simply no plane available in the Gove area.

34. In this regard, I had tendered in evidence before me a statement from Ms Robyn Cahill (part of exhibit 4) which detailed that in fact, on 4 April 2010, there were five fixed wing aircraft and one helicopter available. I do note

however that of those aircraft, two were "offline" for maintenance on 4 April 2010; one for scheduled maintenance and the other unscheduled.

35. Dr Ludwig confirmed receiving the call from Dr Nowak at about 12.20pm. He stated that he was told at that time that the deceased was at Umbakumba clinic, was unwell, drowsy, had frank haematuria (obvious blood in her urine) and a very high BSL. Dr Ludwig stated that he was aware at that time that Umbakumba community did not have an airstrip that was suitable for the air-med plane to land. As a result, before an evacuation could even be considered the deceased would need to be transferred from Umbakumba to Alyangula.

36. In addition, Dr Ludwig gave evidence that it was not his practice to ever send a plane for an air-med evacuation unless and until that patient had been reviewed by a medical practitioner, and unless and until the patient was in the actual location where the plane was to be sent. Dr Ludwig stated that this was because if a plane was sent and the patient was not at that location he was effectively taking away an asset that could be used for other patients should an emergency arise. He also required that a patient normally be assessed by a doctor before the plane was sent to determine the requirement for an air-med evacuation and to stabilise the patient. I note that this is also in accordance with RN Moore's understanding of the process that existed then. Dr Ludwig gave evidence that he certainly believed that he made it clear to Dr Nowak that he would not task the plane until the deceased was assessed by her at Alyangula.

37. Whether Dr Nowak was advised by Dr Ludwig at that time that a plane would not be tasked until she conducted her own assessment or not, it is clear that the decision reached was that the deceased was to be transported from Umbakumba to Dr Nowak at the Alyangula Clinic. I heard evidence that the trip from Umbakumba to Alyangula usually takes about 45 minutes to an hour, but on this particular day the roads were in an extremely poor

condition because of a recent cyclone in the area and so the deceased did not arrive at the Alyangula clinic until about 2.10pm.

38. Dr Nowak gave evidence that when she first sighted the deceased; she appeared to be "in a pre-arrest condition". Dr Nowak described the deceased as follows (p.35.3):

> "She looked awful. She looked – and again it's hard to explain. She looked (inaudible) to me, she looked like a really sick woman, she had that frightened, agitated look that I've seen in patients many, many times before. They (inaudible), I think they get a feeling of impending doom and they know they're sick and they're panicky. And she was – she had a look like that and she was really not a well woman"

39. When Dr Nowak asked the deceased about her pain, the deceased told her she had "none". She noted that the deceased's tongue was "extremely and noticeably pale". She also looked at the deceased's sub-conjunctiva, which confirmed that the deceased was extremely anaemic. As a result, Dr Nowak stated that she contacted the Gove DMO again and advised him of the deceased's circumstances and her deterioration. Dr Nowak stated that she again told the DMO that she considered that an air-med evacuation was required. Dr Ludwig confirmed receiving the second call from Dr Nowak and being advised as to the condition of the deceased. Dr Ludwig noted that the deceased was conscious and haemodynamically stable, with her heart rate and pulse rate were in an acceptable range. As a result Dr Ludwig recorded the deceased as a "category 2" patient.

40. Dr Ludwig stated that at the time of this conversation he requested Dr Nowak conduct an i-STAT test. I received evidence that this is a test conducted on a portable medical device which conducts pathology testing for a range of chemistry tests including electrolytes, urea, creatinine, blood gases and troponin. Dr Ludwig stated that he considered the test necessary so as to assist him in determining how seriously unwell the deceased was and what treatment may be required. I heard evidence that Dr Nowak

advised that she was not trained to conduct the test and that there was no one present who was relevantly trained. I will return to this aspect later in these reasons.

41. Dr Ludwig gave evidence that between 2.20pm and 2.50pm, he again made contact with Air-med Logistics to discuss the retrieval of the deceased. As set out above, Dr Ludwig stated that he had assessed the deceased at that time as a Category 2 patient. I heard evidence that this categorisation assists in determining the level of urgency of having a person evacuated by air and is assessed by the DMO. Dr Ludwig stated that he assessed the deceased as a category 2, rather than category 1, because she was conscious and haemodynamically stable. Dr Ludwig also gave evidence that as a result of assessing the deceased as a category 2, this meant that according to the protocols and policies, the plane (if available) was supposed to leave "within one hour".

42. Dr Ludwig stated that when he spoke with Logistics, he was again told that there was no plane available and that the only plane on line had in fact been tasked to another community to collect another patient who had been assessed as a category 1. In this regard I had tendered in evidence before me (as part of exhibit 4) the "Flight Request Form" for that other patient, which makes clear that the tasking of that plane had in fact been activated at 12.20pm. The plane was required to travel to Port Keats to collect the patient and return to Darwin. It is clear therefore that the other possible plane available on that day was being used for a higher category patient and was undertaking that task well before a decision had been made that the deceased required air-med evacuation.

43. In the meantime I heard evidence that Dr Nowak conducted a bedside HB test. Dr Nowak confirmed the HB level, earlier taken by RN Moore of 44. Dr Nowak again contacted Dr Ludwig and advised him of the results of her test. Dr Ludwig gave evidence that from that test, both he and Dr Nowak

believed that the deceased required an urgent blood transfusion. Dr Ludwig noted that there were no facilities at Alyangula clinic to provide a blood transfusion, but there were at Gove Hospital. As a result Dr Ludwig gave evidence that he again contacted Air-med Logistics and on this occasion he upgraded the situation as a Category 1, which meant the plane should be in the air in 45 minutes. Dr Ludwig stated that although he knew there was still no plane available, he did this so as to highlight the urgency of the situation.

44. In addition, Dr Ludwig spoke with the Darwin DMO on duty that day, namely Dr Andrew Jamieson. I heard evidence that Dr Jamieson was the Senior Rural Medical Practitioner ("SRMP") on Groote Eylandt from January 2006 until January 2010. He then took up the position of SRMP in charge of Operations, Top End Remote Health, in January 2010 and remains in that position. Dr Jamieson has also worked both at Alyangula and Umbakumba and is familiar with the circumstances existing at both those clinics.

45. Dr Ludwig stated that he contacted Dr Jamieson to discuss the management of the deceased. Dr Ludwig gave evidence that as a result of that conversation a decision was made that a plane would be chartered from Gove to Groote Eylandt to convey blood units for transfusion to the deceased. Dr Nowak gave evidence that in this time she also spoke to Dr Jamieson and he confirmed arrangements were to be made for blood to be flown to Groote Eylandt and that they would arrive at approximately 4.30pm, with an air-med plane also scheduled to arrive thereafter at about 6.00pm.

46. Dr Nowak gave evidence that she then returned to the care of the deceased and that during the course of her care she noted that the deceased's HB level had further fallen to 41. Dr Nowak stated that the deceased was:

> "very agitated, asking for water and she appeared to be progressively getting sicker".

Dr Nowak gave evidence that she was concerned that the deceased (p.38.5):

> "I thought she was a lady who was going to arrest. I thought that when she arrested, trying to resuscitate her would be hopeless, because the reason she arrested was from lack of haemoglobin and without blood there wasn't much we could do, yeah. .. It was very frustrating"

47. At 3.50pm on 4 April 2010 the deceased went into cardiac arrest. Dr Nowak gave evidence that she immediately commenced emergency resuscitation, but this was to no avail and she was declared deceased at 4.10pm. Contact was then made with Dr Ludwig to cancel the relevant flights; however the chartered plane had already left and was on route.

Cause of Death

48. Dr Terence Sinton gave evidence before me and provided a report (part of exhibit 4). Dr Sinton is the Director of the Forensic Pathology Unit at the Royal Darwin Hospital. He conducted the autopsy upon the body of the deceased at 9.30am on 6 April 2010. Dr Sinton noted in his report that the condition leading directly to the death of the deceased was acute myocarditis. As stated at the commencement of these reasons, I heard evidence that myocarditis is an inflammation of the heart muscles which can lead to heart failure, just as it did with the deceased. Dr Sinton gave evidence that in his opinion, the condition that gave rise to the myocarditis was a systemic viral infection.

49. Dr Sinton gave evidence that although he considered the cause of death to be myocarditis, one of the symptoms that was not able to be explained by that condition was the rapid decline in the deceased's HB levels. Dr Sinton described this as an unexplained blood loss, that "may" be linked, but there was "no obvious cause". Dr Sinton noted in his report and also during the

course of his evidence, numerous areas where there were signs of blood loss, e.g. the kidneys, bladder, pericardium, ventricles, stomach, uterus, tubes and ovaries. Dr Sinton stated however that despite those numerous sites there was no "large collection" of blood found during his autopsy to identify the "point of bleeding". Dr Sinton gave evidence that this indicated what he referred to as a "multi-system failure", which was what he was referring to when making reference in his report to the "systemic viral infection".

50. During the course of questioning by counsel for the Department, Dr Sinton was asked whether he considered that what was occurring to the deceased was a "haemolytic crisis". Dr Sinton indicated that he did not believe that to be the case in relation to the deceased because there had not been the breaking down and damage of the red blood cells. I note that Dr Jamieson also gave evidence on this issue and stated that in his opinion there was a possibility that haemolysis was occurring. He stated that haemolysis also exhibited sings of jaundice and that was seen in relation to the deceased. Dr Jamieson did however indicate that he could not be sure and that he strongly suspected that the rapid drop in HB levels was linked to the disease process that caused the myocarditis. He indicated that this lack of explanation as to what exactly was occurring with the rapid decline in HB levels simply made it even more difficult for Dr Nowak to be able to determine what was occurring and how best to treat the deceased when she was in her care. For the purposes of this inquest, I do not consider it necessary to make a finding as to the possibility of haemolysis having occurred and I accept Dr Sinton's findings.

51. Dr Sinton gave evidence that although survivable, myocarditis was a condition not easily tested for. He stated that testing required a biopsy to be taken from the muscle surrounding the heart, which was a very difficult and dangerous procedure. Dr Sinton also stated that even if such a biopsy was obtained, it may not successfully identify the condition because the area

where the biopsy is taken from may not necessarily be damaged. Myocarditis is therefore a condition generally discovered post-mortem.

52. As Dr Sinton stated in his evidence, "myocarditis was not the only difficulty" that the deceased was suffering from. The deceased had:

> "chronic diseases with an acute pathology superimposed on the myocarditis".

Dr Sinton stated that although "not inevitably fatal", in order for a patient to survive myocarditis their chances were increased if they did not have any pre-existing health issues and were able to access "supportive care". In terms of the deceased, Dr Sinton stated that she was:

> "very significantly compromised by these either existing or pre-existing conditions"

and therefore her chances of survival were reduced.

53. Dr Sinton stated that in terms of his assessment of a systemic viral infection which led to the acute myocarditis, this was "deduced" from his observations at autopsy and also consideration of the deceased's medical history. Dr Sinton stated that he did not, as a matter of course, conduct viral testing during his autopsies as such testing did not assist to fulfil his function of determining the cause of death. He stated that whilst viral testing may be:

> "important in an ante-mortem setting", it "is not so important in a post-mortem setting"

and I accept this evidence.

Comments upon the evidence

54. At the commencement of this Inquest, Counsel Assisting raised with me 4 matters for consideration in terms of this death. Those matters were as follows:

1. The appropriateness of the care provided to the deceased at the Umbakumba Health Clinic given the deceased's numerous attendances at the clinic on 30, 31 March and 2 and 3 April 2010, prior to her passing on 4 April 2010.

2. Whether the deceased's death could have been prevented.

3. Failure to have a member of staff on duty and available to conduct at i-STAT test at the Alyangula Health Clinic; and

4. The adequacy of arrangements and resources for the evacuation of patients by air in the Northern Territory, particularly considering the issues of:

    i. Whether there are enough planes to service the Northern Territory;

    ii. The sufficiency of the reasoning for not sending a plane at the timing of the first call requesting an air-med evacuation at 12.20pm.

55. I will consider each of these matters in turn.

Care at Umbakumba Clinic and prevention of the deceased's death

56. As noted earlier in these reason, the deceased regularly attended at the Umbakumba Health Clinic and particularly so in the days leading up to her death. She was seen on 30 and 31 March 2010 and then on 2, 3 and 4 April 2010. I have earlier outlined the various diagnoses considered and the treatment provided on those days. It appears however that there was no escalation of response to the deceased's condition over that time.

57. In this regard I note that the Department of Health has conducted a "Root Cause Analysis Investigation" following this death. I received a copy of the report prepared following that investigation dated 22 April 2010 (part of

exhibit 4). I note that the investigation was undertaken with the intention of critically examining all the circumstances relevant to the care of the deceased and to identify any potential areas for service improvement. As I have noted in previous inquests, I consider it important that such investigations are undertaken independently of the coronial inquest process as it enables the various Departments involved to quickly identify failures in systems and to address them proactively for the better provision of services, rather than simply wait for recommendations by me which may flow from the findings of an inquest.

58. In the investigation noted that there had been no escalation of response in relation to the deceased at the Umbakumba clinic and that, in particular there had been no consultation with a doctor in that time. I consider this an important issue given it is clear that the deceased was attending the clinic with a continued possible chest infection that did not appear to be improving in any way, and that the autopsy report indicates that the condition leading to the deceased's death was a viral infection.

59. The report following the Root Cause Analysis Investigation includes within it a recommendation that the 'Department of Health – Remote Health' consider a protocol (which would include an amendment to the "Health Atlas") that requires consultation with a doctor occur "on at least the third presentation, unless there is a clear diagnosis and clinical improvement". I heard evidence that the Atlas is a document issued by the Department of Health that sets out in writing various procedures and protocol to be followed by staff. Dr Jamieson noted it was "wide ranging" and was to be used by remote health staff "in conjunction with the CARPA manual". As I noted during the course of the proceedings these sorts of documents and manuals are extremely important as it is manifestly obvious that remote area nurses who are not supervised for long periods of time need and require written instructions to assist them in undertaking their very important work in the remote communities.

60. I heard evidence from Dr Jamieson that one particular concern with the proposed amendment was that it may remove clinical judgement and add a threshold that is inappropriate. Dr Jamieson did indicate that the recommendation had been before the "Best Practice Committee" and endorsed, however the Committee was still considering the appropriateness of the wording and he had received a commitment that this would occur and be finalised "within the next 2 weeks".

61. In this regard, whilst I can understand some level of concern about possible inappropriate thresholds resulting, it certainly appears to me that a properly worded protocol including the words "on at least" would clearly indicate to any health worker that there does not need to be 2 consultations before any referral can be made, but that if there hasn't been any improvement and the patient has been seen "on at least" 2 prior occasions, then consultation with a doctor should occur. This seems to be a very sensible and practical addition. I also note RN Fato's evidence before me that he has himself changed his practice so that if a patient has retuned more than twice for a similar condition and there has been no improvement, then he contacts the on-call doctor.

62. As an important aside on this issue of contacting a doctor, I also note RN Fato's evidence that had he seen the HB test result for March 2010 then he would certainly have called a doctor on 2 April 2010. I accept RN Fato simply overlooked this entry and I accept that he did everything that he thought was appropriate at the time for the proper care and treatment of the deceased.

63. Because of the current state of progression of this amendment in protocol, I do not consider it necessary to make a specific recommendation, however I encourage the Department to actively pursue this amendment in the Atlas as soon as possible to ensure that greater consultation occurs between clinic staff and medical practitioners when a patient is regularly attending a clinic

and does not appear to be improving. It is a concern that the recommendation from the Root Cause Analysis came about back on 22 April 2010 and doesn't appear to have progressed much further, however I accept Dr Jamieson's evidence that he received a commitment that this will be addressed by mid-June 2011.

64. Although it is by no means an absolute certainty that a consultation with a doctor ***would*** have prevented the death of the deceased, I do consider that an escalation in response should have occurred and may have resulted in earlier identification of the risk of myocarditis. I also accept the evidence of Dr Sinton that had the risk of myocarditis occurred at an earlier stage, and supportive measures been able to be put into place, that the deceased would have had a much greater chance of survival. I also accept the evidence of Dr Didier Palmer that the kinds of measures that would have been required to be put in place including ventilation, blood and blood product, broad spectrum antibiotics, intravenous anti-viral treatment and intensive care were the sorts of:

> "heroic"

measures necessary and that even then the:

> "outcome is usually poor and the chances of survival are low".

65. As I said during the course of proceedings however I consider that it is clear on the evidence that this death ***may*** have been prevented if the deceased had been identified earlier as being at risk of myocarditis and had been transported in a timely fashion to the Intensive Care Unit at the Royal Darwin Hospital. However what would have happened thereafter once all those supportive measures were put in place is a matter of some conjecture.

66. It is of course also clear that even if the deceased had been told she needed to see a doctor, she may have refused to go. It may also have been the case that she refused to be admitted to hospital for such treatment. However I

find that her chances of survival would, more likely than not, have increased had an escalation in response occurred and consultation taken place with a doctor. I wish to make clear that my comments in this regard should not be interpreted to mean that I am critical of either RN Moore or RN Fato. I am of the opinion that both those nurses did their very best when dealing with the deceased. I considered their evidence to be credible, thoughtful and both were impressive.

67. I also note that Dr Jamieson gave evidence that in his opinion, and following his review of the medical records for the deceased, he considered that on 2 April 2010 an ECG:

> "should have been performed"

as the deceased had chest pain. Dr Jamieson went on to state that had an ECG been performed, this may have assisted in the diagnosis as it:

> "can be indicative of myocarditis".

68. In this regard I note that RN Fato was the nurse attending upon the deceased on 2 April 2010. As stated earlier in these reason, RN Fato gave evidence that he did indeed consider an ECG test in accordance with the CARPA manual, but determined that one was "not necessary" as the pain described to him by the deceased was sharp and only when she coughed. I accept this evidence from RN Fato. I accept that he properly considered the requirement for an ECG and was cognisant of the chest pain being described, but after weighing up what he was presented with, he made a decision not to carry out an ECG. I consider his thought process to have been reasonable in the circumstances. Whether the ECG would have in fact assisted, I do not know. However the importance of this aspect is that RN Fato did in fact consider this option and made a considered decision not to administer an ECG for the reasons already mentioned.

i-STAT test

69. As identified earlier in these reasons, when the deceased was at the Alyangula Health Clinic, Dr Ludwig requested that Dr Nowak perform an i-STAT test. Dr Ludwig's evidence was that in his opinion such a test would have helped to determine how severely unwell the deceased was and what treatment may have been required. Unfortunately, neither Dr Nowak nor any of the persons at the clinic at the relevant time were trained in conducting such a test. I received as part of exhibit 4 a copy of the relevant portion of the 'Department of Health – Remote Health Atlas' related to i-STAT testing. Within that document it makes clear that whilst the i-STAT analyser "is relatively easy to operate there are potential risks to this valuable equipment, and the quality of results, if misused". As a result, staff that are not certified as qualified i-STAT operators are not authorised to use the machines.

70. It was also identified as part of the Root Cause Analysis Investigation that the i-STAT cartridges for acid-base and biochemistry were out of date. Therefore even if there had been a certified operator at the Alyangula clinic, the testing still could not have been done. I heard evidence from Dr Jamieson that the acid base cartridge would have been useful on this occasion:

> "to quantify the deceased's acid base"

however he stated that it would:

> "not have materially added to the therapeutic options that were available at that time"

for the deceased.

71. In terms of these issues I note that a recommendation from the Root Cause Analysis is that Remote Health reinforce to all staff the need for accurate checking of i-STAT cartridge dates and adherence to monitoring systems

already in place. Also that as part of the induction of any medical practitioner there be certification for the use of the i-STAT machine. I heard evidence that induction did not occur with Dr Nowak because she had commenced her employment over the holiday period and prior to the formal introduction of a structured orientation which commenced in March 2010. I understand that this induction has now been carried out and that Dr Nowak is now certified to operate the i-STAT machine.

72. I received evidence from Dr Jamieson that each i-STAT machine costs approximately $12,000 but he agreed that if the cartridges are out of date then the machine is effectively worthless. It is therefore extremely important that it be understood that the cartridges must be kept up to date to ensure that this vital piece of equipment is able to be used. I heard evidence from Dr Jamieson that since the introduction of full time Continuous Quality Improvement nurses, quality assurance has improved significantly. I accept this evidence and do not seek to say anything further on this issue.

73. I do note however that the evidence before me indicates that at 3.10pm an i-STAT test was in fact performed. Whilst I consider it a concern that such an important machine could not be used when first considered necessary because there were no operators at the relevant time and the cartridges were out of date, I also note that it is clear on the evidence that with or without an i-STAT test, it was clearly understood and recognised that the deceased was seriously ill and required evacuation. As Dr Nowak stated, the results of such a test would not have changed her decision making in terms of the deceased requiring an evacuation. An i-STAT test was therefore not needed to form this view, as it had already been formed. The i-STAT test also did not alter the situation that there was still no plane available to evacuate the deceased. This brings me to the next issue of concern.

Adequacy of arrangements and resources for the evacuation of patients by air in the Northern Territory

74. A great deal of evidence was received on this issue. I also note that this was the subject of consideration in the Department of Health's Root Cause Analysis Investigation. Tendered in evidence before me was a statement from Ms Robyn Cahill, Director of Acute Care Systems Performance, Northern Territory (part of exhibit 4). Ms Cahill has held that position since 11 August 2009 and has responsibility for the oversight of a number of services in the Northern Territory, including (relevantly to this inquest) the Northern Territory Aero Medical Service ("NTAMS").

75. Within the statement of Ms Cahill it is noted that in 2003 aircraft requirements for NTAMS were contracted to Pearl Aviation Australia Pty Ltd requiring four aircraft and 13 pilots for a period of five years with a five year option. The services were operated out of three bases, namely Katherine (Tindal Air Base), Gove and Darwin. At that time all bases covered a 24/7 emergency roster and were staffed with four nurses. Each base was required to have one aircraft active at all times with the fourth being in scheduled, and where necessary, un-scheduled maintenance.

76. It appears that in July 2008 there was a review undertaken by the (then known as) Department of Health and Families of the capacity and capability of the NTAMS. Recommendations were received on 20 November 2008 which included a replacement of all 4 aircraft and that the service be re-tendered to enable a fully integrated service incorporating the provision of aviation, medical and nursing resources by the one provider. As noted above, Pearl Aviation only provided the aircraft requirements for the service, with NTAMS providing the other resources.

77. It appears from the statement of Ms Cahill that before the contract could be re-tendered there needed to be discussions held with Pearl Aviation in relation to the termination of their contract. This appears to have taken

some time to occur, meaning that the re-tendering process could not take place. Settlement of negotiations with Pearl Aviation appear to have finalised in December 2009, thus enabling commencement of the new tender process.

78. As to be expected with such a significant contract, this was not something that could occur overnight. I note that Ms Cahill's statement outlines that Pearl Aviation continued to provide aircraft until 30 June 2010, at which time CareFlight (NSW) would provide the logistic coordination, nursing staff and aircraft. This was referred to during proceedings as the "interim service". This is the position that has remained in place until the date of this inquest.

79. Whatever the status of the contract, it is clear that Pearl Aviation was still the provider of aircraft and pilots as at 4 April 2010. The statement of Ms Cahill makes clear that on that day at the time when the deceased was coming to the attention of medical staff, two of the "Darwin" aircraft were "offline" for maintenance. The "Gove" aircraft was online, but had no pilot available due to ill health and no replacement being available. The other "Darwin" aircraft was then used for the flight to Port Keats for the Category 1 patient. There was another aircraft, but this was tasked for retrieval at Palumpa and there were insufficient pilot hours for that to be used.

80. It appears that consideration was given to the use of the helicopter that was remaining for the Port Keats retrieval, but because that patient was a category 1 it was deemed not suitable. In this regard I pause to note that the deceased was herself subsequently upgraded to category 1 and therefore suitability of the helicopter would also have been an issue.

81. In relation to these circumstances I also note that I received evidence from Dr Palmer that the helicopter would have been inappropriate for use in travelling from Darwin to Groote Eylandt as it would have required too many "hops" in order to get to Groote Eylandt. This was simply because the

distance required to be travelled was outside that normally able to be taken by helicopter. Dr Palmer also identified that too many "hops" would have meant that it simply took too long for the helicopter to get to the deceased.

82. Dr Palmer also stated that the significant problem at that time was that the planes being used by Pearl Aviation were simply too old for an air-medical retrieval service. Dr Palmer noted that they were between 25-28 years old on average and this resulted in more unscheduled maintenance for each aircraft in order to stay in service. Dr Jamieson also noted in his evidence that a further issue that arose was that as the Pearl Aviation contract was coming to an end, a number of the pilots resigned in order to obtain other employment and this meant that there were a reduced number of "back-up" pilots for when a pilot became sick.

83. As Dr Palmer referred to it during his evidence, the events of 4 April 2010 were a good:

> "snapshot of the types of problems that were in existence under the previous contract with Pearl Aviation".

As was also admitted by Dr Palmer in his evidence, it was the case that the service previously provided under the contract with Pearl Aviation was:

> "simply not good enough".

Both Dr Jamieson and Dr Palmer spoke with great enthusiasm as to the improvements that would occur when the new tendered service was completed and commenced. I heard and received evidence that the new service would "provide a far more integrated service" with the one provider delivering:

83.1 Four (4) dedicated fixed wing medically fitted aircraft which would result in three (3) aircraft being online 24 hours per day, seven days per week;

83.2 One (1) dedicated rotary wing medically fitted aircraft;

83.3 24 hour logistics coordination;

83.4 Medical specialist case managers/flight taskers (critical care specialists rather than GP's/DMO's) on a dedicated roster providing single point high level advice on all cases;

83.5 Flight doctors and nurses;

83.6 Medical director;

83.7 Operations manager;

83.8 Clinical governance;

83.9 Medical education;

83.10 Regular reporting of stringent KPI's, including airframe down time and pilot down time.

84. One of the matters raised during the course of this inquest is, with all the changes referred to (although noting that the interim service is still in place) as having already occurred and planned to occur with the new service, whether this would result in a better service for the Northern Territory (and particularly in relation to this inquest the Gove district including Groote Eylandt).

85. In this regard I received evidence from Dr Nowak that in her opinion the air-med service operating back in 1994-1996 (when she was employed for the first time in Groote Eylandt):

> "seemed to have a system that worked better then".

Dr Nowak noted that then there was a plane based in Gove and a retrieval doctor also located in Gove. Dr Nowak stated it was her opinion that "more planes are needed" and that there was a (p.39.3):

> ".. public perception that people think that when they get sick they can get medical evacuation quickly. And certainly on this day there were problems with the plane. And I think we have to be honest enough to admit, that if – if there are problems we have to admit there's problems. And I'm particularly concerned, because I think the public like, I said, they have that perception that they can be evacuated quickly. And people need to be informed so they can make appropriate choices. And there's many people who have serious ill health. And if the situation is that we can't evacuate them when they get sicker, they may actually want to choose to live in a place where there is a hospital".

86. In addition, Dr Ludwig also stated that although he could not:

> "back up with any data",

it was certainly his "impression" that there:

> "probably more cases that have to wait longer now than before".

Dr Ludwig also noted that one of the changes is:

> "we basically lost the control of the plane"

in the Gove community. It was clear to me that both Dr's Nowak and Ludwig did not consider that things had improved following the death of the deceased.

87. In relation to the new service I note that Dr Jamieson gave evidence that the question of having a plane based in Gove was "discussed at some length" as part of the tender. Dr Jamieson stated that (p.11 of 25/5/11):

> "while it would be a nice thing to have, we don't feel that it's practical to station an aircraft on standby for something that could go wrong, because of the demands placed on the aircraft"

88. In terms of the evidence of Dr Ludwig in relation to having an aircraft on standby in the past, Dr Jamieson stated (p.12):

> "It's never - it's never been the case where an aircraft has been placed on standby should something go wrong. I think the thing that Dr Ludwig was referring to was prior to about maybe a year ago,

maybe a little bit longer, the Gove doctor was very much more in control of the Gove aircraft and - and had the final say-so on whether the aircraft flies or not, and for equity reasons in terms of the fact that it did occur, that the rest of the Top End was struggling to find an aircraft while the Gove aircraft was parked on the ground here. Central tasking was decided to be the most equitable use of resources. I think that it's within Dr Ludwig's right to advocate on behalf of his clients, his patients. But I think the practicalities of it, unfortunately, don't necessarily make that possible at this time".

89. Dr Jamieson also pointed out that one of the other significant issues was that it was not just a plane that was needed but also a specialist emergency doctor who was ready and available to leave on the plane when required. Dr Jamieson stated that it had been experience in the past that the doctors in Gove would be required to undertake other work in Gove resulting in them being unavailable to travel with the plane when required.

90. In relation to the concerns and frustrations expressed by the doctors, Dr Palmer also importantly stated (p.22.5):

> "It's understandable from their perspective. I think when you take a 30,000 foot view of the service, we're talking about capacity to respond across the Top End, for all the patients across the Top End, and there is - there is no aero-medical retrieval argument for having separately coordinated aircraft. You see, the Gove aircraft, if it's not being used in the Gove area, can be tasked out to Katherine area or even Darwin area at times, as can all the other aircrafts. So there needs to be, to provide wider coverage, better response times globally across the Top End. You need to have single point logistics, clinical and logistic coordination. And that is a very basic concept and one that is accepted throughout the retrieval community in Australia, and it is - and that is what has happened throughout retrieval services in states and territories in Australia".

91. In relation to the question of retrieval times, Dr Palmer stated (p.23):

> "We - we've run some stats which - on the - on the KPIs, and that, your Honour, is the launch times and the number of times they're within launch, KPIs. So for a P1, for example, that would be a launch at up to 30 minutes. And the KPIs are running, over the last six months, at around 91, 92%. Now, the national gold standard is 94% and that's built into the tendered contract. But that sort of level

of response, and I'm talking - I don't have the data for specifically the Gove area, but that sort of response is certainly a very great improvement from the previous provider where it was not uncommon to have 60, 70% KPI achievement".

92. In terms of the new system to be offered under the tender, Dr Palmer gave evidence as follows (p.24):

> "So at the present the interim service has, in terms of availability, two - two and a half aircraft, and by a half aircraft I mean that's flying 12 hours a day, two and a half aircraft available 24 hours, so - and plus a dedicated rotary wing. Not an ad hoc rotary wing, a dedicated rotary wing is a helicopter which is available and medically configured ready for launch immediately. Within - and that's 15 hours. And we've scanned how much we need and that's about what we need. You can go over that but you just pay more. With the tender process, we're looking at having three aircraft 24 hours, so that's a significant change, and also in terms of capacity we're looking at having, rather than one of those critical care staff, we'd have two 24 hours critical care staff. And so again that's a doubling of that capacity. And also within the capacity issues there are the pilot hours and the Category A maintenance which means that there are far fewer down times. So at the times when that stated capacity drops due to unscheduled maintenance should be very much minimised by the level of maintenance and dedicated engineering, and also by having younger aircraft. And also in terms of capacity you'll have the critical care tasking which goes to appropriateness and order and re-classification in times of added stress, which improves and is shown to improve significantly in other states and jurisdictions, the asset availability so that you can - the lower acuity, the very much lower acuity patients can be transported on charters on a dedicated CME aircraft, for example, leaving the capacity in your critical care aircraft for the people you are going to save lives with".

RECOMMENDATIONS

93. At the conclusion of the evidence in this matter, I considered that it was essential that I make a recommendation to the Minister that the awarding of the tender for the new service be finalised without delay. I was persuaded by the evidence before me that this was an essential service that needed to be finalised and appeared to be taking a very considerable time to do so. As I stated during the course of closing addresses, so far as this death is

concerned, it appears it **may** have been preventable with intensive care at Royal Darwin Hospital, but it also may not have been.

94. Since the conclusion of evidence, and whilst preparing these reasons, I have received correspondence from Mr Jeffrey Moffett of the Department of Health dated 4 July 2011 informing me that Care Flight had been awarded the tender for the Top End Medical Service. I note that in terms of that service, I was also advised as follows:

> "The integration of the new service will begin in January 2012, with an implementation to occur over the coming 12 months. The full service should be in place by 1 January 2013".

95. It is not clear to me as to why there is such a considerable "integration" and "implementation" period, however given the contract has been awarded, I no longer consider it necessary to make a specific recommendation in this regard. However I do recommend the Government, and specifically the Department of Health, work hard at ensuring that the new service, which is clearly an improvement for the lives of many people across the Top End, is implemented as quickly as possible.

96. I have no further recommendations to make.

Dated this 27th day of July 2011 _____

GREG CAVANAGH
TERRITORY CORONER