CORONERS ACT, 1975 AS AMENDED

SOUTH  *AUSTRALIA*

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 11th, 12th, 13th, 14th and 15th days of November 2002 and the 4th day of March 2003, before Anthony Ernest Schapel, a Coroner for the said State, concerning the death of Virginia Vassallo.

I, the said Coroner, find that, Virginia Vassallo aged 59 years, late of 1 Greenfield Crescent, West Lakes Shore, South Australia died at The Queen Elizabeth Hospital, Woodville South, South Australia on the 26th day of October 2000 as a result of multiple cerebral infarction due to infective endocarditis.

1. Introduction

1.1. Mrs Virginia Vassallo, who was aged 59 years, died on 26 October 2000 at The Queen Elizabeth Hospital (the Hospital) where she was a patient. She had been admitted to the Hospital on 20 October 2000.

1.2. The deceased had initially presented at the Emergency Department of the Hospital on the afternoon of the previous day, that is 19 October 2000. She had been brought to the Hospital by ambulance. Members of her family had also attended. The South Australian Ambulance report referred to her as suffering from pain in various parts of her body such that she was unable to walk. On that day she was seen by Hospital medical practitioners and then discharged.

1.3. At the time she presented at the Emergency Department of the Hospital on 19 October, the deceased was undoubtedly suffering from a condition known as Infective Endocarditis and, as well, septicaemia. Infective endocarditis is a condition caused by bacterial infection, in this case staphylococcus aureus, otherwise known as golden

staph. In her case, the infection caused a build up of material, referred to medically as 'vegetation', on one of the valves in her heart. The deceased was predisposed to such a condition as she had an irregularity in that valve. This irregularity may have been the result of her having contracted rheumatic fever as a child. This predisposing valvular irregularity had been diagnosed for some time. It was not a life-threatening condition and caused little or no impact on her general well-being. However, the irregularity was such that it could attract infection. This potential had been recognised over the years by her treating medical practitioners.

1.4. Infective endocarditis is a life threatening illness. Undiagnosed, it has a 100% mortality rate. It will either destroy the valve, lead to infarctions of brain tissue (strokes) or cause an overwhelming septicaemia. Although the deceased's presentation on 19 October was a reflection of the infection existing in her body, neither a diagnosis of the bacterial infection nor the infective endocarditis was made on that occasion. She was discharged from the Hospital during the evening of 19 October with the erroneous diagnosis of a viral infection for which she was treated with a pain killer and a steroid.

1.5. On 20 October 2000, the day after her initial presentation, the deceased was extremely unwell. Her local general practitioner was called to her home. He took the view that the deceased should be admitted to hospital. He arranged for an ambulance to convey her again to the Hospital where she was this time admitted. On this occasion the presence of a bacterial infection in the deceased's body was eventually recognised and she was placed on a broad spectrum antibiotic. However, the infective endocarditis initially remained undiagnosed. In the early hours of the morning after her admission, the deceased's husband saw what he thought to be indications that the deceased had suffered a stroke. Her speech was slurred and she could not move one of her arms. She had in fact suffered a stroke. Pieces of the material that had lodged at the site of the deceased's heart valve had broken off and lodged in her brain, resulting in multiple infarctions in her brain tissue. The fact that the deceased had suffered a stroke was then formally diagnosed, as was the cause of it, the infective endocarditis. The deceased was treated with staph aureus specific antibiotics to which the infection adequately responded. However, she suffered further strokes and died from their effects on 26 October 2000.

1.6. This inquest examined why on 19 October 2000, when the deceased first presented at the Hospital and on 20 October when she re-presented at the Hospital, the infective endocarditis was not diagnosed at a time before the catastrophic effects of it, that is the strokes, were recognised. The inquest also examined the issue as to whether an early diagnosis and treatment of the infective endocarditis, particularly on 19 October 2000, would have prevented the unfortunate outcome in this matter. Another issue examined was whether working conditions at the Hospital may have contributed to diagnostic error.

1.7. I find that the cause of the deceased's death was multiple cerebral infarctions due to infective endocarditis.

2. The circumstances of Mrs Vassallo's death

2.1. The deceased's valvular irregularity had been detected many years ago. For instance, her Queen Elizabeth Hospital record (Exhibit C4) reveals that in 1981, when the deceased was treated at the Hospital for a foot disorder, it was observed that she had a valvular irregularity and was advised to have prophylactic antibiotics prior to any dental or other surgical manipulations. In August 2000, some weeks prior to her death, she had been treated at the Hospital for angina, possibly caused by nicotine patches she was using in an effort to quit smoking. Routine heart tests had again detected the valvular irregularity. In fact there were irregularities present in two of the valves of her heart. This inquest was concerned with the complications associated with the mitral valve. Her cardiologist in August 2000 was a Dr Margaret Anne Arstall who, as it happens, was to be involved in the deceased's management after her stroke in October.

2.2. Dr Arstall was called at the inquest. She explained to me that two of the deceased's heart valves were affected. She stated that the irregularities had no significant effect on heart function or her health in general, but:

> '… people who have abnormal cardiac valves, it is a fairly avascular tissue, it doesn't get a lot of blood supply and the implication of that is that it doesn't get a lot of immune cells get into the valve. If the valve is abnormal it appears that the valve is more at risk of any infection that may be, or bacteria that is circulating in the blood stream, whether for just a transient period or more prolonged period, may stick onto the valve and start to grow there and create an infection there. The immune system has, it is fairly isolated from the immune system and it is very difficult for our immune cells to actually attack the bacteria that is growing on the valve and so it can grow almost unhindered or with very limited inhibition by our immune system and so infections on valves are very dangerous and are

> a very difficult problem for the body to deal with. Valves that are abnormal, either from rheumatic fever or from congenital abnormalities or various other reasons, are certainly at risk, more at risk of getting infections on them than normal native valves, although a normal native valve can still get an infection as well but it much less likely.' (T295-6)

2.3. On 28 September 2000 Dr Arstall wrote a letter to the deceased's general practitioner, Dr McLean, explaining the deceased's pathology. She explained in the letter that the deceased had mild aortic and mitral valve regurgitation. She pointed out that the deceased would require antibiotic prophylaxis for any surgical or invasive procedure, recognising of course the consequences that could flow to the deceased from the development of a bacterial infection (T296). Dr Arstall was a consultant at the Hospital. I cannot find a copy of this letter in the deceased's Hospital casenotes as such. However, there is a letter dated 21 August 2000 written to Dr McLean by an orthopaedic surgeon, interalia, reflecting on the need for antibiotic prophylaxis, but not explaining why. I think Dr Arstall's letter should have been in the casenotes, given that the deceased had been treated for this episode at the Hospital.

2.4. That the deceased had developed a staph aureus infection before her presentation on 19 October 2000 is clear. The source of her infection is undetermined. There is no suggestion that the deceased had any visible lesion that may have alerted Hospital staff to a possible source of bacterial infection.

2.5. The deceased attended at the Hospital on 19 October 2000 at 12:13pm. This time was taken from the triage assessment form. She was recorded as a triage priority 5 which, according to the Australian Triage Scale, meant that she should have been attended to within two hours. In the event she was not seen by a doctor until about 4:30 that afternoon. The triage form describes her 'presenting problem' as 'musculo-skeletal-joint pain'. Her triage assessment is described as 'c/o low back pain and aching joints since arthritis medication changed'. The form also refers to her episode of angina in August 2000. The deceased was initially seen by a Dr Atef Kolta, a resident medical officer. Dr Kolta had access to the triage assessment form but not the ambulance report which referred to her inability to walk. Dr Kolta noted the deceased's various aches and pains including chronic back pain and severe bony aches of both shoulders and knees since the day before. It also described severe tearing pain in her back, the sudden onset of which had occurred the day before. She had a fever which was reflected in temperatures of between 37.8°C and 38.2°C. Those two temperatures were taken at 4:30pm and 5:30pm respectively.

2.6. Dr Kolta examined the deceased and found that she was unable to sit up and unable to move her shoulders due to pain. In addition, she was unable to bend her knees, also as a result of pain to the posterial part of the knee.

2.7. As far as the deceased's past medical history was concerned, although Dr Kolta told me that he knew nothing about the previous admission in August 2000, and that he did not have access to any notes concerning that admission, it is to be observed that the triage form makes reference to an attendance by the deceased at the Hospital on 12 August 2000 with a discharge diagnosis of 'angina pectoris, unstable'. The deceased's episode of angina in August 2000 has no relationship to the outcome in October, but it is nevertheless to be observed that it was known to the Hospital generally in August 2000, and even earlier, that the deceased had a valve irregularity that predisposed her to serious infection. Dr Kolta on examination determined that the deceased had dual heart sounds with an astolyic murmur on the apex. The deceased herself told Dr Kolta when he questioned her about her history of heart disease that she had mitral regurgitation.

2.8. It is evident that Dr Kolta did not draw a connection in his mind between any cardio irregularity and the deceased's presentation on 19 October when undoubtedly her presentation was a reflection of a serious infection involving her heart valve at that time. As it transpired, Dr Kolta had to hand over this particular case to another medical practitioner as his shift concluded before the deceased was discharged. The deceased was handed over to a Dr David Lincoln who was a registrar within the Hospital. Before the handover, Dr Kolta had arrived at a number of possible differential diagnoses in relation to the deceased, all of which were wide of the mark. They were a dissecting aortic aneurysm, a viral infection and severe inflammatory muscle disease. Dr Kolta told me that in his view the more likely diagnosis was the viral infection. The features of the deceased's presentation which led him to prefer that diagnosis were the vague fever of about one day's duration and bony aches all over her body. As far as a possible diagnosis of infective endocarditis was concerned, Dr Kolta said that he saw no signs suggestive of the same including signs of heart failure, heart enlargement or splenic haemorrhage in the fingers. Although she had a history of mitral valve disease and presented with a mild fever and bony aches, Dr Kolta said that it would have been difficult to make a diagnosis of a bacterial endocarditis. In short, he did not consider such a potential diagnosis. To use his words, such a diagnosis was 'not to be on the top of the list' (T31).

2.9. Dr Kolta told me that he performed a complete blood examination. There was a minor dispute as to whether it was Dr Kolta or Dr Lincoln who caused the complete blood examination to be conducted. Dr Kolta has made some reference to blood tests in his notes and I find that whether or not Dr Kolta caused them to be performed, he certainly expected them to be performed, and they were. Certainly, Dr Kolta did not see any of the results of that blood test as his shift concluded before the initial results became available.

2.10. When Dr Lincoln took over the deceased's management he was furnished with the triage assessment form and Dr Kolta's notes. Dr Lincoln did not have access to the ambulance report which suggested that the deceased was unable to walk. However, it had been plainly evident to Dr Kolta that the deceased's mobility had been seriously compromised insofar as she was unable to sit, unable to move her shoulders and unable to bend her knees. There is nothing to suggest that by the time the deceased was discharged later that evening her mobility had in any way improved.

2.11. Dr Kolta did not give any consideration to whether or not the deceased should have been admitted to Hospital on this occasion because he regarded his task as being 'just primary assessment for her general condition and collection of some blood for her' (T31).

2.12. Dr Kolta also did not consider that the performance of a blood culture was necessary. A blood culture is undertaken in an endeavour to identify the presence and nature of bacteria in the blood. Dr Kolta's reason for not ordering a blood culture was that in his view the conventional blood examination results should be examined first and, in addition, he was of the understanding at that time that there was a policy possibly in place that dictated that there had to be an obvious reason for performing a blood culture or where, for instance, the patient's temperature was greater than 38.5°C. In addition, blood cultures take some time to be performed and analysed and the results of a blood culture would not have been available to Dr Kolta that evening. Other evidence confirms that blood cultures do take time to bear fruit. I have already observed that the complete blood examination results were not available to Dr Kolta when he finished his shift.

2.13. Dr Lincoln had access to all of the information that Dr Kolta had obtained during his examination. In addition, Dr Lincoln had access to biochemistry results and the results of the complete blood examination, save and except for the blood film review

which is not usually available when complete blood examination results are initially reported. Dr Lincoln did not make any notes of his examination of the deceased at the time of the examination. However, he compiled a typewritten discharge letter addressed to the deceased's general practitioner, Dr McLean. The deceased was under Dr Lincoln's care until her discharge that evening. Dr Lincoln first saw the deceased probably shortly before 6pm when Dr Kolta, whose shift was imminently to end, handed the case over to him. Dr Lincoln understood from Dr Kolta's handover that the deceased was suffering predominantly from muscle aches and pains. Dr Lincoln said that Dr Kolta had mentioned "severe ripping back pains of some description" (T70) as well as predominant shoulder pains and leg pains as well. Dr Lincoln was aware of the ongoing low-grade fever that the deceased had been suffering and understood that this had persisted for the last two to three days. Dr Lincoln took the view that one of Dr Kolta's differential diagnoses, namely a dissected thoracic aorta, was inappropriate and dismissed it. Dr Lincoln was more concerned that the deceased was suffering from infective conditions such as a viral infection. Dr Lincoln was also made aware of the deceased's heart murmur but was not aware whether it had been of long standing or otherwise.

2.14. While the deceased was under Dr Lincoln's care that evening some of the results of the complete blood examination were made available to him. He also had access to the biochemical analysis results. The results appeared on a computer, the tests having been conducted by the IMVS. Dr Lincoln told me that some of those results were indicative of a viral condition. However, the initial results of the complete blood examination were of some significance in terms of the deceased's eventual diagnosis of a bacterial infection. In particular, the deceased had a slightly low white blood cell count and a low platelet count. The low white blood cell count was interpreted by Dr Lincoln as being most likely associated with a viral infection, whereas such a white cell count can also be indicative of a bacterial infection. He interpreted the low platelet count as being consistent with an idiopathic thrombocytopenic purpura (ITP) which is consistent with platelet destruction associated with viral conditions.

2.15. However, the platelet count of 23 was significantly low. Platelets are a clotting agent in the blood. The platelet count, which is normally in the range of 150-400, was a reflection of her body's inability to produce platelets due to the profound effects of her infection. Dr Lincoln did not consider the low platelet count to be reflective of a

bacterial infection. Dr Lincoln said that there are a multitude of conditions which can cause a low platelet count but said:

> 'Unfortunately at the time of being with Mrs Vassallo I only considered three of those conditions, which, two others were associated, of kidney functions, and it was a low, significantly low count.' (T182)

The diagnosis of ITP at which Dr Lincoln arrived was, in his view, the sequelae of a viral illness. In the deceased's case he did not observe any evidence of a rash consistent with ITP, but on the other hand, as it is more commonly seen in children, its absence in an adult is of less significance in determining whether an ITP is present.

2.16. Dr Lincoln did not consider the possibility of an infective endocarditis. He said that he did not know the extent of the deceased's known heart disease and as far as her valvular disease was concerned he thought he had only found out about that a week after her death.

2.17. Dr Lincoln came to the view that the deceased's pain was an inflammatory reaction to the viral illness and in the event his diagnosis was described in his discharge letter to Dr McLean as 'muscle cramps, general'. The letter went on to describe:

> 'Likely inflammatory myalgia secondary to viral/immune complex aetiology.'
> (Exhibit C5)

In short, Dr Lincoln formed the view that the deceased was suffering from a viral infection, that her general pain was a reflection of that and that her low platelet count was the reflection of an ITP, also associated with a viral infection. He prescribed Panadeine Forte for the pain, and that was administered to her while she was at the Hospital. In addition he also prescribed a steroid, Prednisolone.

2.18. Dr Lincoln did not have access to the complete blood examination film review result before he discharged the deceased from the Emergency Department of the Hospital. These results, which were to be of significance, are normally not available until about 24 hours after the complete blood examination samples are taken and submitted for analysis. They were not available on the evening of 19 October and only became available sometime prior to 11am the following morning. I infer this from the time recorded on a computer reading of those results, namely 11am on the morning of 20 October 2000. I will return to the film review results presently, and in

particular as to what significance they could have had as far as Dr Lincoln's diagnosis was concerned.

2.19. However, there is one matter arising out of the deceased's physical presentation and appearance whilst she was in attendance at the Hospital during the afternoon and evening of 19 October 2000 that does not appear to have been adequately evaluated. I have already alluded to the fact that the ambulance report suggested that the deceased was unable to walk. The nursing assessment on 19 October also refers to the deceased as being 'bed ridden since Tuesday with arthritis' and that the deceased was complaining of 'severe all over body pain' (Exhibit C4). On top of that, the deceased had been observed by Dr Kolta as being unable sit or to move her shoulders and her knees, all due to physical pain. There was no evidence before me as to the means by which the deceased left the hospital that evening, but it is fair to say that no-one observed the deceased being able to walk. Dr Lincoln told me that it was part of the Hospital's discharge policy that every patient must be seen to be mobilised. He made the observation that her ability to mobilise, or lack of it, had not been witnessed by any member of the staff prior to her leaving the Hospital. He conceded that mobilisation was the responsibility of the doctor discharging the patient or the senior nurse in charge of the Department. He said:

> 'The usual thing is that we try and manage to get every patient mobilising who is expected to be able to mobilise.' (T105)

There is nothing to suggest that the deceased's condition or presentation at the Hospital on 19 October 2000 improved in any significant way. Dr Lincoln said that if he had the ambulance report, which had suggested an inability to walk, it would have warranted further investigation and, depending on the results of such investigation, a decision to admit would have been taken. He did not have the ambulance report at the time. The only improvement detected by Dr Lincoln while the deceased was under his care was that at around 8pm that evening she appeared to be starting to derive some pain relief as a result of the painkillers he had prescribed. He had seen a smile on her face which he hadn't seen before. However, it is evident that he did not see her mobilising in any way and agreed that unless she was seen to be walking she should not have left the Hospital.

There is nothing in the evidence which suggests to me that the deceased derived any tangible benefit from her treatment at the hands of Hospital staff on the night of 19

October 2000. This was plainly because the deceased's underlying illness was not diagnosed. Worse than that, her underlying illness was not in any sense addressed properly. Had the entirety of the complete blood examination results been available to medical staff, the situation may well have been different. I have already referred to the fact that the complete blood examination film review was not available on the night of 19 October. The film review result was to add significant information to the whole picture. It indicated in particular that the neutrophils in the deceased's blood showed a shift to the left and toxic changes. In addition, the presence of crenated cells suggested that there was some possible evidence of intravascular destruction of red cells or evidence of a septicaemia. All of that, Dr Lincoln conceded, was suggestive of an overwhelming infection (T85). Dr Lincoln also conceded that if the information had been available to him on 19 October he would have concluded that a severe sepsis was present, although such a diagnosis would not have advanced the issue as to what the source of that sepsis may have been. The sepsis would have been consistent with a bacterial infection and probably would have led medical staff on 19 October to commence intravenous antibiotic treatment. The issue as to whether, even without the film review result, an overwhelming bacterial infection should have been considered and diagnosed on 19 October is another matter that has to be considered. In this regard, Dr Lincoln frankly conceded that the cause of the very low platelet count was not adequately assessed by him on 19 October. Such an alarming platelet count, indicative as it is of significant pathology, should have been retested that evening and if the original level had been confirmed and remained unexplained it would have been appropriate for the deceased to have been admitted to Hospital by reason of the low platelet count alone. Dr Lincoln conceded this at T114 where he also conceded that a confirmed platelet count of 23 would also have attracted the need for a haematologist to be brought into the matter. A haematology registrar was not consulted until the deceased's re-presentation on 20 October 2000.

2.20. The deceased was discharged by Dr Lincoln on the evening of 19 October. He wrote a discharge letter to her general practitioner, citing the viral diagnosis to which I have mentioned.

2.21. On 20 October 2000 the deceased's condition worsened such that her family called her general practitioner, Dr McLean, to come to her home. I don't need to go into the details of Dr McLean's assessment to any great extent. However, it is plain from Dr

McLean's evidence, which I accept, that the deceased appeared to be extremely unwell. Dr McLean had been provided with Dr Lincoln's discharge letter by the deceased's family. It is evident that Dr McLean was also given the preliminary biochemistry and complete blood examination results because he refers to them in a letter that he compiled for the purpose of referring the deceased back to the Hospital. Dr McLean was not only concerned about the deceased's apparent state of debilitation but was particularly concerned with the low platelet count to the extent that he underlined it in his letter. Dr McLean took the view that the deceased was suffering from a major illness which he could not determine. In his letter, he made a number of suggestions as to possible diagnoses. Significantly, he did not single out infective endocarditis as a possible diagnosis, notwithstanding the fact that being her general practitioner, he knew as much as anyone about the potential complications that might arise if the deceased were to develop an infection in conjunction with her valvular irregularity. I don't mention this by way of criticism of Dr McLean because the task at hand as far as he was concerned was to ensure that the deceased was admitted to hospital as soon as possible. In any event, it is evident that Dr McLean at least considered the possibility of a bacterial infection because, amongst other things, he suggested in his letter that the performance of blood cultures was a matter that should be attended to urgently. I pause here to observe that Dr McLean did not have access to the complete blood examination film review when he saw the deceased on 20 October.

2.22. Dr McLean as I have mentioned was concerned about the low platelet count of 23. He referred to that as a result that 'stands out overwhelmingly' (T145). It indicated to him that something was seriously wrong and that it had to be addressed. He was of the view that the low platelet count in itself suggested that she had a major illness, particularly when coupled with her outward general state of debilitation. It had surprised Dr McLean that someone so unwell had been allowed to go home the day before with such a low platelet count. He said all of that would have conspired to dictate the necessity for further investigation. I agree with Dr McLean. Although it seemed to be accepted that the deceased appeared more unwell on 20 October when she was seen by Dr McLean, the fact of the matter was that the deceased had been obviously unwell the day before, as evidenced by her severe pain and limited mobility.

2.23. Dr McLean rang for an ambulance to take the deceased to the Hospital. He also spoke to the Hospital triage nurse to see if the deceased could be accorded some priority but was told that priority could not be guaranteed as the Hospital was 'very, very busy' (T152).

2.24. Dr McLean agreed that the film review results, which he did not see at the time, generally indicated an infective illness of a bacterial nature.

2.25. The ambulance attended at the deceased's home promptly and took the deceased to the Hospital in the same fashion. According to the triage assessment form of 20 October the deceased was triaged at 5:58pm with a presenting problem recorded as 'system infection - malaise'. The deceased was accorded a triage priority of 4 which suggests a low priority but in the event was seen less than an hour later at 6:48pm. On this occasion she was seen by a Dr Wilczynska who gave evidence in the inquest. Dr Wilczynska had some difficulty in persuading the deceased's family to allow the deceased to remain at the Hospital. They expressed the desire that she be permitted to leave and be taken to a private hospital. Dr Wilczynska had little to do with the deceased's treatment apart from setting up a drip, arranging further blood tests, and arranging for a haematology registrar, Dr Goh, to attend. Dr Wilczynska recalled that the deceased's platelets were low and in fact further tests were conducted which revealed that the level had decreased to an even lower degree, namely to a level of 19. Dr Wilczynska could not recall having seen the film review results from the day before, but agreed that those results were significant and could be indicative of a septicaemia. Dr Lincoln was also involved in the deceased's management on 20 October. Dr Lincoln had no recollection of whether or not he reviewed the film review results on 20 October. He told me that it appeared from the Hospital records that a computer search at 11am that day had brought up those results and, in the normal course of events, the results would have been reviewed by a medical practitioner whose task it was to review outstanding pathological examination results. Dr Lincoln suggested that such a review possibly could have occurred around midday or lunchtime. There was no evidence before me as to when precisely those results were seen and considered for the first time nor whether any action was taken in the light of the results. The deceased was at her home on the morning of 20 October. She was seen by Dr McLean in the afternoon and taken to the Hospital just before 6pm. Dr Lincoln agreed with me that had those results been known and their significance

identified prior to the deceased returning to the Hospital, those results, together with everything else that was known about her, would have warranted a telephone call to her to get her to return to the Hospital. Although there is no evidence directly on point, I am prepared to infer that no call was ever made to the deceased or her family in order to inform her or them of the results of the film review. In the event, it seems that the significant features of the film review were never really properly addressed at a time that may have enabled the deceased to receive more timely treatment for septicaemia. As I say, even when she returned on 20 October neither Dr Wilczynska nor Dr Lincoln could say whether or not the film review result was available to them or, if it was, whether they considered it.

2.26. Although the deceased was seen by Dr Wilczynska in a timely fashion and in accordance with the Triage Scale, there was a further delay between her being seen by Dr Wilczynska at 6:48pm and the haematology registrar attending to examine the deceased at about 10pm. The haematology registrar was Dr Jeffrey Chee Hong Goh. Dr Goh had been on call that evening and had received a telephone call at his home from Dr Wilczynska at about 9:15pm. There is no suggestion that Dr Goh did anything other than accord his task the priority and diligence that it merited. He was told by Dr Wilczynska that the patient had a low platelet count and was generally unwell. When he examined the deceased he had Dr McLean's letter which set out the blood results from the day before, save and except of course for the film review. Dr Goh formed the view that the deceased was very ill to the point where she was unable to respond coherently either from pain or confusion. The platelet results were of significance to Dr Goh and, based upon a history given to him by the deceased's family of unwellness, increasing lethargy, loss of appetite and other matters, Dr Goh thought that she appeared to be clinically septic. Other matters that led him to that conclusion were the general history, the fact that she had rigours and shakes and also from the history of her having had a temperature the day before. Dr Goh was also aware of the heart abnormality and formed the view that there was evidence suggesting she had mitral regurgitation, which she indeed did have. Dr Goh ordered chest x-rays and other tests and came to a number of differential diagnoses including ITP, which Dr Lincoln had considered the day before, connective tissue disease, underlying malignancy and chronic obstructive airways disease, but in the end was of the correct view that she had a likely bacterial infection, given that she was extremely ill.

2.27. Dr Goh commenced the deceased on intravenous fluids and ordered some blood cultures on the suspicion that she had a generalised infection. The most significant treatment accorded by Dr Goh was the commencement of an intravenous antibiotic called Ceftriaxone, which is a broad spectrum antibiotic. The idea behind the broad spectrum antibiotic was to control whatever unidentified bacteria was present. The antibiotic was not specific for staph aureus, which was not to be identified until some time later from the cultures that Dr Goh ordered. However, there is some evidence that Ceftriaxone had a therapeutic benefit. It is to be observed that although Dr Goh did not diagnose an infective endocarditis at the time, it was only at his instigation that treatment of any significance in terms of bacterial infection was commenced. By then more than 30 hours had passed since the deceased had first presented at the Hospital on 19 October. Dr Goh said that an infective endocarditis may have occurred to him during his examination and treatment of the deceased on the evening of 20 October but that such a diagnosis was 'low on my list of causes of low platelet count' (T217). He considered the sepsis to be more likely the result of a chest infection. As to why he did not put bacterial endocarditis on the top of his list of potential causes he said:

> 'Firstly, endocarditis, I tend not to see as much of that in the haematology unit. It's mainly dealt by the cardiologist and number two; any form of sepsis may be endocarditis, pneumonia, florid pneumonia, or any form of other sepsis could put down the platelet count so sepsis, as a general term, encompasses a lot of different conditions and endocarditis is just one of them.' (T218)

2.28. As it transpired, the infective endocarditis was in reality not considered until the effects of it had manifested themselves in the form of a stroke, the symptoms of which Mr Vassallo observed in the early hours of the following morning.

2.29. Dr Arstall, the cardiologist involved in the deceased's management stated in effect that the plan formulated by Dr Goh was appropriate. I accept her evidence on this. The taking of blood cultures, a chest x-ray and commencement of antibiotics on spec was the normal method of treatment in the initial stages. In particular, she said that the broad spectrum antibiotic that was used, namely Ceftriaxone was an appropriate antibiotic in situations where the source of the infective illness could not immediately be identified. As well, she stated that a staph aureus endocarditis is an unusual thing for someone to think of in an Emergency Department situation, hence the use of broad spectrum antibiotics. The particular antibiotic, Ceftriaxone, was to her mind a 'not

inappropriate' antibiotic to use (T303). On the other hand, if endocarditis was suspected, a more specific antibiotic such as penicillin with gentamicin would probably have been a better method of treatment. Dr Arstall told me, however, that by the evening of Saturday 21 October the deceased was afebrile, that is to say with no elevated temperature and this suggested that she had experienced a response to Ceftriaxone antibiotic.

2.30. In the event, staph aureus was only identified by way of culture after the deceased had suffered at least one stroke. I will return to the issue as to whether or not earlier treatment specifically for a staph aureus endocarditis would have made any difference as far as the outcome in this case was concerned, but suffice it to say that at this stage there appears to be no basis for levelling any criticism at the haematology registrar Dr Goh in respect of the examination he performed or the treatment that he initiated. On the contrary, on the evidence of Dr Arstall, his treatment had almost text-book correctness.

2.31. As against this however, criticism has been levelled in relation to the deceased's management on 19 October when she first presented at the Hospital. This criticism is largely accepted by Dr Lincoln in particular. Evidence was given by a Professor Anne-Maree Kelly who is the Director of Emergency Medicine at the Western Hospital of the University of Melbourne. She was asked to examine the relevant statements and reports as well as the relevant case files in relation to this matter. At the outset, it has to be observed that Professor Kelly was of the view that a diagnosis of an infective endocarditis is particularly difficult to make. I do not understand Professor Kelly to be critical of the fact that this specific diagnosis was not positively made within the Emergency Department of the Hospital on 19 October, particularly in light of the fact that the results of some tests were not available, for example the complete blood examination film review. However, Professor Kelly's criticism was focused on the fact that such a diagnosis does not appear even to have been considered. As well, she says that the deceased should have been admitted at her first attendance in any case. I will come to the details of her criticisms presently, but insofar as it suggested that Dr Kolta should have initiated tests which may have revealed a source of infection or initiated an examination to look for evidence of a dissected aorta, it has to be borne in mind that Dr Kolta was only involved in the deceased's initial assessment and that he effectively handed the whole matter over to

his more senior colleague, Dr Lincoln, at the end of his shift. Dr Kolta also told me that it was he who initiated the complete blood examination. That is very possible, and as earlier observed, he obviously had this issue in mind. Dr Kolta had no part to play in the decision as to whether or not the deceased should be admitted to hospital on 19 October. In those circumstances it is difficult to be critical of Dr Kolta. Dr Kolta, as best he could, made a number of differential diagnoses which no doubt he thought would be given due consideration by the medical staff who were to take over from him. His differential diagnoses were not in any way recorded as firm diagnoses and it is impossible for me to conclude that in all the circumstances Dr Kolta had sufficient information in the time available to him to make any firm diagnosis, either of an overwhelming infection or of an infective endocarditis in particular.

2.32. As mentioned, Professor Kelly was critical of the decision not to admit the deceased at her first attendance at the Hospital. She states in her report dated 3 January 2001 at page 5 that the deceased had a known, high risk valvular heart disease and an unexplained fever. She also referred to the unexplained platelet count of 23 which she described as a level which was concerning. As a minimum, she says the case should have been discussed with a haematologist to establish appropriate treatment and investigation and, given the complicated clinical picture, admission would have seemed warranted. In addition, at page 4 of her report she expressed the view that the source of the deceased's fever was not properly evaluated, 'especially in light of the known valvular heart disease'. Professor Kelly expressed the view that the cause of the very low platelet count was not adequately assessed and the treatment that was administered was commenced without ruling out other possible important causes of such a low platelet count such as a sepsis. Professor Kelly raised a number of other criticisms including Dr Lincoln's failure to make any notes of his examination beyond the rather brief discharge letter addressed to Dr McLean. I think this criticism is valid and I do not think Dr Lincoln says otherwise. The fact of the matter is, however, that his failure to make any proper and adequate notes at the time had little impact on the outcome in this case.

2.33. As to whether a specific investigation for an endocarditis would have been warranted on 19 October, Professor Kelly gave this passage of evidence:

> 'A. That's somewhat softer in terms of the recommendation because there would appear from the notes to be no hard evidence suggesting endocarditis other than the known murmur. However in a patient with a known murmur and no other source, no other

source of infection, some investigation of that may well have been warranted but as I said it's a softer recommendation than the others.

Q. We have heard some evidence during the course of this inquest to the effect that there are many possible sources of the infection and that perhaps endocarditis is not the one that immediately reaches the top of the list in the setting of Mrs Vassallo.

A. That's true. But the converse is also true, it's a very hard diagnosis to make. It has a very poor outcome, particularly in older woman with co-morbidities; if you don't think about it early you don't catch it and you don't treat it.

Q. Was there anything else about Mrs Vassallo's presentation apart from this history of, say, valvular disease that would immediately in your opinion lead someone to consider whether it was endocarditis at that time.

A. The history of the valve combined with systemic symptoms, ie, fever and the aches and pains all over is what would concern me. As I said however, it's a softer one. If I found another source of infection or if she looked very well – which I can't judge – then I may have thought about it and discounted it as very unlikely.' (T318-9)

2.34. Professor Kelly said that the presence of fever and the presence of a generalised severe muscular ache and backache were the prime indicators of a septicaemic illness which would have warranted the administration of blood cultures at the same time as other tests such as the complete blood examination. To this extent her evidence is at odds with Dr Kolta who expressed the view that a blood culture would depend on the result of a complete blood examination, which in any event he did not see. The evidence of Professor Kelly has to be preferred in this regard. She said that when administering tests for infection, the tests are not performed in a sequential process. She said:

'It's a parallel process. If I think a patient has a septicaemic illness it doesn't bother me what the white cell count is. I would go and order blood culture. It's not a do step 1, do step 2 process.' (T320)

2.35. Professor Kelly was also critical of the fact that there appeared to be an inadequate assessment of the deceased's mobility given that the nursing notes reveal that she had been bedridden 'since Tuesday'. I have already referred to the fact that Dr Lincoln did not at any stage see the deceased mobilise and Dr Kolta's examination in particular would have suggested that she was quite immobile, given that she was unable to move limbs and was unable to sit.

2.36. Criticism was also levelled at Dr Lincoln's prescription of Prednisolone either for the treatment of myalgia or ITP. In the event, this criticism is not as significant as others

because Prednisolone was not the answer to any of the deceased's suspected ailments on 19 October and, in any event, had no demonstrable effect on the outcome.

2.37. Professor Kelly conceded that it was unfair to judge the medical practitioners who were concerned in the deceased's management on 19 October in the absence of the results of the film review which were indicative of bacterial infection, but she expressed the view that even without that result, there was enough evidence to have required further investigation.

2.38. The criticisms levelled by Professor Kelly are reinforced by the evidence of Dr Robert Dunn, who was the Director of Emergency Medicine at the Hospital, and therefore Dr Lincoln's superior. He agreed in his evidence that there were shortcomings in the deceased's management on 19 October 2000. He stated that in a setting of symptoms and signs that suggested infection, the low platelet count would have dictated that a significant bacterial infection would need to be considered (T279). The low platelet count is not usually associated with viral illness and he considered it unlikely that the low platelet count would have been associated with an ITP as such pathology usually occurs at a time after the acute stage of a viral illness (T280). Dr Dunn agreed that in a situation that prevailed here, that is where the patient was in reality no better after treatment, and unable to walk, normally the patient should not be discharged. I accept Dr Dunn's evidence on these matters.

2.39. To summarise, the nub of Professor Kelly's criticism was the failure to consider a possible diagnosis other than the differential diagnoses arrived at by Dr Kolta and Dr Lincoln, the failure to give adequate weight to the very low platelet count and the failure to admit the deceased to hospital for further evaluation and examination. I agree with this criticism insofar as it relates to Dr Lincoln. The low platelet count in particular, on the evidence that I have heard, was reason in itself for concern. The deceased had known valvular disease, she presented as generally unwell with general pain consistent with an infection and, even without the film review results, there was sufficient in my view for Dr Lincoln to at have least considered the possibility of the existence of an overwhelming bacterial infection and a septicaemia. Whether infective endocarditis, in an Emergency Department setting, should have been suspected as the source of the infection is another matter – Professor Kelly suggests that would be one of the softer diagnoses. However, the possibility of a bacterial infection should in my view have been recognised and appropriate treatment

including tests to determine the source of the infection, the administration of broad spectrum antibiotics and the taking of blood cultures in those circumstances should all have occurred on 19 October. A haematological specialist should have been consulted about the low platelet count. As I have mentioned, Dr Lincoln accepts that the low platelet count in itself should have warranted further investigation.

2.40. As far as the deceased's treatment on 20 October is concerned, Professor Kelly was of the view that her examination was 'a little slower than I would like, partly contributed by the fact that the initial treating doctor was quite junior in experience'. As observed earlier the deceased arrived at the Hospital just before 6pm and nothing of consequence happened in respect of her treatment until approximately 10pm when Dr Goh took over her management. For about one hour of that period the deceased was waiting to be seen post-triage. There was initially some uncertainty as to whether she would remain at the Hospital or be moved to a private hospital. The delay was not otherwise explained.

3. <u>Whether earlier treatment for septicaemia or infective endocarditis would have had any impact on the outcome of this matter</u>

3.1. The issue as to whether timely and appropriate treatment on 19 October 2000 would have led to a different outcome is a difficult question. The mechanism of the deceased's death was that particles of the vegetation that had formed on the deceased's mitral valve broke off and caused infarctions or strokes in her brain. This did not happen all at once. The evidence suggests that this pathology continued over a period of some days. The first indication that this had taken place was when the deceased's husband in the early hours of 21 October, which was during the first night of the deceased's admission, observed signs suggestive of a stroke, namely a slurring of speech and an inability to move her left arm. These observations were noted at 3:20 in the morning of 21 October. The issue that needs to be considered is whether if the deceased had been diagnosed with septicaemia and/or infective endocarditis on 19 October the breaking off of the vegetation on her mitral valve could have been prevented or limited in extent.

3.2. An echo-cardiogram was performed in respect of the deceased's heart in the presence of Dr Arstall following the stroke in the early hours of 21 October. The echo-cardiogram was performed some time before 2pm that day. The vegetation was observed to have been quite large; more than 10mm in size. Dr Arstall told me that vegetations of that size are considered to attract high risk at two levels, firstly they

break off and embolise and secondly there is in any event difficulty in killing off all the bacteria attached to the heart valve because it can shelter itself inside the large vegetation. This results in difficulty in neutralising the infection to the point where surgery sometimes has to be conducted in order to remove it. In this case the vegetation was of a significant size and this meant that even while antibiotics specific to the actual bacteria are being administered, the patient is still in trouble and at risk for several weeks of particles of vegetation breaking off and causing infarctions in the brain. Dr Arstall did not consider the deceased to be a candidate for surgery and so once the staph aureus bacteria was identified and specific antibiotics were administered, the deceased was still not out of the woods. In any event, as I have earlier observed, much of the damage to her brain had already taken place at a time prior to staph aureus specific antibiotics being administered.

3.3. The evidence seems clear to me that the deceased had an overwhelming septicaemia when she first presented at the Hospital on 19 October. The septicaemia was undoubtedly a consequence of an infected mitral valve. However, Dr Arstall was of the opinion that septicaemia was not the cause of death. She said that in her view the cause of death was brain tissue infarction resulting from the breaking off of vegetation on the mitral valve. She summarised the position thus:

> 'Yes, my view of course, you can never be 100% certain, you would need a parallel universe where the alternative occurred. In my view, she died, not of sepsis, she died as a consequence of the embolic events, which caused significant cerebral damage and it was thought that she was coning, that she had significant brain swelling and then she died. If she had died of septicaemia of the total body stopping, where her blood pressure goes low and you can't control it, her kidneys shut down and various other things, such as an overwhelming septicaemia, then every time was of the essence and you could possibly say that missing out on 24 hours of treatment led to her demise but that wasn't the case. Throughout most of the time until the very end when her neurological state affected her circulatory state, she was in a good circulatory state and her blood pressure was reasonable, if you look at the intensive care notes and in high dependency. And by the Saturday she had become a febrile, suggesting she had responded appropriately to antibiotics but, as we discussed before, the emboli can continue to fly off, despite appropriate treatment and even earlier diagnosis for a week or two afterwards and even with good treatment, this can kill you and I think that is how she died.' (T307-8)

Although I do not have the benefit of a post mortem examination report, as no autopsy was performed, I can readily understand and accept Dr Arstall's evidence. I accept Dr Arstall's analysis that septicaemia was not the cause of death. She died, I find, from the brain infarctions caused in the circumstances described by Dr Arstall. The

evidence of Dr Arstall suggests that it is not possible to determine whether or not the strokes which eventually led to the deceased's death could have been prevented either by antibiotic or surgical treatment that might have been administered if any earlier diagnosis had been made on 19 October. Dr Arstall conceded that the delay of a day could have led to the vegetation being larger on 20 October, but in her view the deceased was even then so considerable risk. As to whether a day could have made any difference in that situation, she said that it probably would not have but that you would 'never know 100%' (T311). Specifically, as to whether or not the delay may have resulted in the vegetation growing to such an extent that it more easily gave rise to embolic events than it would have 24 hours earlier, Dr Arstall said that she could not say and that it would only be speculation to suggest an opinion either way. Dr Arstall also said that in her view surgery would not have been indicated at a time before the embolic events had taken place because surgery is usually only indicated after an attempt has been made to sterilise the infected valves and the resulting vegetation with antibiotics. Thus it would seem that surgery at an earlier time would not have made any significant difference as the first line of treatment would have been antibiotic treatment in any case.

3.4. Professor Kelly also expressed a view as to whether or not an admission on 19 October could have altered the deceased's outcome. Given Dr Arstall's statements about the extent of the deceased's disease, Professor Kelly was of the view that an earlier diagnosis and treatment probably would not have affected the outcome.

3.5. I accept the evidence of Dr Arstall and Professor Kelly in relation to this issue.

4. Conditions within the Emergency Department of The Queen Elizabeth Hospital on 19 October 2000

4.1. I heard a great deal of evidence about the conditions for both patients and medical staff at the Hospital and in particular those in the Emergency Department as it existed in October 2000.

4.2. A number of the medical practitioners who gave evidence in this inquest described the conditions under which they worked in October 2000. Dr Kolta recalled that 19 October 2000 had been a busy day. There were many presentations that day in the Emergency Department and this meant that the medical staff had become exhausted working with many patients, such that they had been required to work on two or three

patients at the same time. Dr Kolta described a situation where, because of the lack of beds in the Hospital generally, patients were kept awaiting admission in the Emergency Department. On occasions he would hand over a patient to another practitioner at the end of a shift only to find when he commenced his next shift that the same patient was still in the Emergency Department waiting for a bed in a general ward. This resulted in difficulties in seeing new patients in the Emergency Department and the resulting workload was such that it created 'a lot of work and a lot of pressure on the doctors by having that system like that' (T55).

4.3. Dr Lincoln, who made the decision to discharge the deceased on 19 October 2000, also referred to the fact that 19 October was a particularly busy day. When he began his shift that morning his impression was that there was a large number of patients in the Department. He said in his estimation there were close to 50 patients in the Department at about the time that the deceased presented that day. He referred to the fact during that afternoon, the Emergency Department went on what is referred to as ambulance diversion where, because of the workload within the Department, ambulances were diverted to other hospitals. Dr Lincoln was the senior registrar in the Department that day which meant that he not only had his own caseload, but was required to be available to resident medical officers for the purpose of giving them advice on an adhoc basis. In general terms, Dr Lincoln described a situation where in October 2000 the Emergency Department at the Hospital was experiencing great difficulty in managing its then current workloads. There were a large number of presentations at the Emergency Department and as well, a backlog of patients who had been there for up to three days with the result that there was a blockage of access to beds within the Emergency Department itself. At that particular time ambulance diversion was occurring approximately every second day which usually reflected the fact that there were a large number of patients in the Department; in his assessment somewhere between 45 and 50 patients where the bed capacity was about 26. Dr Lincoln does not work at the Hospital on a fulltime basis at the present time. However, he told me that 50% of his current practice is concerned with work within the Emergency Department of the Hospital. In his view the conditions that he described as applying in October 2000, if anything, are now worse. He told me that effectively there was only one extra bed facility within the Department for the treatment of patients. He described a situation that currently prevails where doctors are rostered to see patients in the waiting room and in the ambulance bay as opposed

to clinical areas, to the point where patients are sometimes admitted to the Intensive Care Unit from the Emergency Department waiting room. To use his expression 'it's not working very well' (T103). He said that the admission of patients from the waiting area of the Emergency Department straight to the Intensive Care Unit was a reflection of the fact that serious presentations are waiting longer. People with potentially life-threatening outcomes, far from being accommodated in adequate treatment areas, are being held in the waiting room for long periods of time. In Dr Lincoln's view the extra treatment facility has not made any appreciable difference and that the bed-block problem is, if anything, worse than it was in October 2000. Shortly before this inquest was held, a situation had developed where the Emergency Department was not permitted to go on ambulance diversion even though staff were hampered by overcrowding, where as many as 50 patients or more were presenting with no beds actually available for them. He referred to the difficulty of having to accommodate patients on barouches because there was no space even in the waiting room or ambulance bay.

4.4. Notwithstanding Dr Lincoln's description of the conditions under which he was working in October 2000, and in particular on 19 October, Dr Lincoln believes that his decision to discharge the deceased that day was not actually influenced by the existing overcrowding in the Department. That Dr Lincoln was not to ascribe any of the shortcomings in his treatment of the deceased to his working conditions reflects well on him. However, other evidence which I will deal with suggests that the conditions under which medical practitioners have to work in Emergency Departments can have a negative impact on the quality of their work without them actually being conscious of it.

4.5. Dr Wilczynska in her interview with the police (Exhibit C11) said that as of October 2000 the Emergency Department was extremely busy. She recalled that everyone working within the Department including nurses and doctors were extremely busy and that the conditions were difficult to work under. She referred to having been:

> '.. pushed psychologically because we were aware that so many patient are waiting a few hours in the Emergency Department and we have work – no-one told us actually but I was working under some stress because I had to see patient who were waiting in Emergency Department for long hours; it caused additional stress for me, I can tell about myself.'

Dr Wilczynska left the employ of the Hospital after October 2000.

4.6. Dr McLean, the deceased's general practitioner, who at all material times conducted his practice in the Hospital catchment area, has regularly referred his patients to the Hospital Emergency Department. He receives, as one would expect, feedback from his patients as to their experiences at the Emergency Department. He referred to a situation where his patients would frequently tell him that they had to wait a very long time to be seen, depending of course on their presenting complaint. On the other hand, he said that other patients had expressed satisfaction with the service that they had received at the Hospital. His impression was that the level of a patient's satisfaction depended on how busy the Department may have been on any particular day and also upon the nature of the complaint. Dr McLean also told me of situations where he had wanted patients to be admitted to the Hospital because of an inability to manage at home or look after themselves and they have not been admitted. He also described one instance where he had to sent and re-sent a patient to the Hospital on several occasions and in the event the patient went to Ashford Hospital for admission because he had not been able to receive treatment at the Hospital.

4.7. Dr Robert Dunn, the Director of Emergency Medicine at the Hospital in October 2000 was effectively the most senior medical practitioner within the Emergency Department at that time. Although he has since relinquished that position, he continues to work in the Hospital Emergency Department one day a week as a staff specialist. He is not actively involved in the administration of the Emergency Department any longer, but is aware of the current circumstances that exist within the Department as far as overcrowding is concerned.

4.8. Dr Dunn described the situation as of October 2000 generally and in particular the conditions on 19 October. He also gave some evidence about the circumstances as they exist at the current time.

4.9. Dr Dunn was to my mind an impressive and frank witness. He was a careful historian and a man who to my mind was not prone to exaggeration. I have no hesitation in accepting his evidence in its entirety.

4.10. On 19 October 2000 Dr Dunn was on duty as the Administrative Director of the Department, and also in his capacity as the Consultant to the Department. As such he was the most senior medical practitioner working in the Department that evening. As it so happens his duties that night included the preparation of a letter to the then

Minister for Human Services, Hon Dean Brown MP, in which he was endeavouring to explain the severe difficulties under which his Department then had to operate.

4.11. Dr Dunn presented some statistical information in relation to the patient caseload on 19 October 2000. I do not need to go into the details of that evidence except to say that throughout the afternoon and evening of 19 October 2000 the Emergency Department of the Hospital was operating above its designed capacity and throughout most of that period approximately 50% of the available bed space was taken up by patients awaiting admission to hospital. Those patients were unable to be transferred to general ward beds due to the lack of availability of such beds. That situation is referred to as bed-block. On 19 October, the Emergency Department had been short of one junior doctor during the day shift and two doctors during the evening shift, although they were able to find another more junior doctor to fill one of the vacancies on the evening shift. At that time they were short of general medical staff as the Hospital was unable to provide enough medical staff to supply the Emergency Department with its full quota. Dr Dunn himself was not involved in patient management that evening as he was compiling the letter to the Minister to which I have earlier referred. Dr Dunn told me that Dr Lincoln was the only Registrar working within the general area of the Emergency Department at the material time and so, effectively, he was the most senior operational practitioner on duty in the Department.

4.12. Dr Dunn demonstrated to me that during the afternoon of 19 October the Hospital went on ambulance diversion. This took place at 3pm and the Department remained on diversion until probably about 7pm from Dr Dunn's recollection. Ambulance diversion in the words of Dr Dunn occurred 'unfortunately reasonably frequently' (T243). During the month of October 2000 there had been an approximate total of 2.5 days of that month during which ambulance diversion applied. This of course was a reflection of how busy the Department was in that month and no doubt a reflection of the fact that the Department was unable to cope with the number of patients seeking treatment. Dr Dunn told me that the first half of October 2000 was one of the worst fortnights in his career.

4.13. The deceased had been accorded a category 5 triage assessment with the expectation under the Australian Triage Scale that she would be seen within two hours of presentation. In the event, she was not seen until nearly four hours later. Dr Dunn

told me that at that time the achievement of an optimum target of two hours occurred in approximately 70% to 75% of patients in that triage category. At the time, that statistical performance varied significantly from day to day. The primary reason for the triage benchmarks not being met was overcrowding of the Emergency Department caused by a constant influx of patients, and by patients who were requiring hospital admission not being admitted due to the unavailability of hospital beds within the general wards of the Hospital.

4.14. Dr Dunn's letter to Mr Brown dated 19 October was produced in evidence at the inquest (Exhibit C15b). The letter refers to a meeting with Mr Brown that had taken place on 13 October. The Chief Executive Officers of a number of Emergency Departments and the Directors of those Departments had attended. The meeting had been designed to give interested parties the opportunity to air various concerns about the capacity of the public hospital system to provide emergency care. Dr Dunn had attended the meeting in his capacity as the Director of the Emergency Department of the Hospital. Three days prior to 19 October, twenty nursing home beds at the Hospital had been opened. This had only provided transient improvement and bed access had remained a significant problem as of 19 October. There had not been any clear improvement between the meeting on 13 October and 19 October, although Dr Dunn acknowledged that this period of time may have been insufficient to have resulted in a significant improvement.

4.15. Dr Dunn had expressed the view in his letter to Mr Brown that the then conditions in the Emergency Department had been the result of decreasing bed numbers and an inability to get patients out of the Emergency Department into hospital wards. That was not to say that there was necessarily in a literal sense bed unavailability. There were difficulties in financing the continued utilisation of beds together with difficulty in finding adequate numbers of staff to care for people occupying those beds, particularly nursing staff. This situation had led to beds being non-operational.

4.16. Pertinently, in the light of the issues in this inquest, Dr Dunn had this to say in his letter of 19 October:

> 'I believe that the staff of our Department are some of the best and most committed in the entire health system, so it is distressing to see many of them showing obvious signs of stress and mental exhaustion. Recent levels of work stress are not sustainable, and resignations of key staff members will soon follow if significant improvements do not occur quickly.'

The difficulties being experienced in the Emergency Department of the Hospital, and their effect on staff were thus well-known to Government in October, 2000.

4.17. Dr Dunn was asked in cross examination by Ms Hodder, Counsel Assisting the Coroner, as to whether any possible connection between the deceased's management and the conditions and circumstances that prevailed in the Emergency Department at the time could be drawn. Dr Dunn said that it was his view that the conditions that were present in the Emergency Department at the time, and indeed prior to that time and since, had the potential to contribute to errors of judgment through various mechanisms. The view that he expressed was based on his observations of the working conditions at the Emergency Department, on his understanding of how medical decisions were made and also on his understanding of the consequences of emergency crowding in terms of interruption of medical practitioners' thought processes. Dr Dunn referred to a study, the results of which had been published earlier in the year 2002, that identified for an ordinary emergency practitioner an average of ten interruptions per hour and that such interruptions to their work had the potential to influence memory processing and to give rise to potential for error.

4.18. Professor Kelly also referred in her evidence to the effect of less than ideal working conditions on the performance of treating medical practitioners. She referred to a scenario where Dr Lincoln, being in charge as he was of a very busy Emergency Department, and trying to supervise a number of very sick patients as well as a number of junior doctors, as giving rise to a potential where, with all the best intentions, errors can occur particularly when, to use her words, 'you are just so pushed to do one thing after another and you are getting 20 questions from 20 different people'. Although Dr Lincoln had eschewed the suggestion that the working conditions had any effect on his performance on the night of 19 October 2000, Professor Kelly referred to her personal knowledge of scenarios in which errors of significant magnitude had been made in Emergency Departments and which had largely been related to workload. She referred to a situation where people who work in Emergency Departments become desensitised to the difficulty associated with heavy workloads. She was of the view that it had to be acknowledged that the conditions under which medical practitioners operate can affect their decision making and, as well, encourage them to cut corners that shouldn't be cut. This may serve to encourage some medical practitioners not to admit some patients who perhaps should be admitted. She referred in particular to the matter before this inquest where she was

of the firm view that the deceased should have been admitted to hospital at the very least for pain control and nursing. Professor Kelly referred to a natural inclination on the part of medical practitioners to send patients home because there are no beds and told me that she had seen many of her colleagues send people home in circumstances where they otherwise would not have, but for their desensitisation to the whole problem.

4.19. I acknowledge that Dr Lincoln did not lay claim to the adverse working conditions under which he was working as having any effect on his decision making as far as the deceased's discharge from the Hospital was concerned. Dr Lincoln admitted that Professor Kelly was correct when she expressed the opinion that the deceased should have been admitted on 19 October. He acknowledges that in view of the deceased's low platelet count she should have been admitted. Dr Lincoln told me that he had given very careful thought to the issue as to whether overcrowding and other difficulties that existed in the Emergency Department had some bearing on the decisions that he had made for the deceased. This had played on his mind for nearly two years and he had concluded that he had not been swayed to discharge the deceased due to overcrowding in the Department that day. I accept that Dr Lincoln honestly believes this to be the case, and I am favourably impressed by the fact that Dr Lincoln has chosen not to cast blame in any other direction. However, it has to be recognised that as a matter of common sense, in an environment of severe overcrowding the potential for error on the part of medical practitioners, especially in a setting where a decision has to be made as to whether a patient should be discharged or not, will inevitably exist. There was no suggestion that Dr Lincoln is anything other than a competent practitioner and, notwithstanding what Dr Lincoln himself said, errors such as his might only be explicable by bringing factors such as stress and pressure into the equation.

4.20. Dr Dunn also gave evidence about the situation at the Hospital that prevailed at the time of the inquest in November 2002. His observations were based on the fact that he still continues to work at the Emergency Department one day per week as a staff specialist and that his continued association with the Department enables him to provide an accurate overview in relation to such important issues as Emergency Department overcrowding. He told me that he is aware of what is happening in that regard and suggested that the prevailing unsatisfactory situation is 'fairly obvious to anybody who walks in, one can see what the problems are' (T245). Dr Dunn told me

about the slight increase in bed numbers in the Emergency Department of the Hospital. This had been undertaken in order to address some of the problems related to overcrowding. Whereas in the past there had been doubling up of patients in the one treatment area, additional treatment areas have obviated the necessity for that. However, the reality is that a slight increase in numbers resulting a nett gain of only one or two bed spaces. Whilst this increase had little impact on the number of workable treatment areas, it meant that the areas were perhaps utilised more efficiently than they had before. Worryingly, Dr Dunn told me that certainly over the few months leading up to the inquest scenarios involving patients lying on barouches in the corridor and in the ambulance bay were worse than in October 2000. In this regard, he corroborates the picture as described by Dr Lincoln. He suggested that the number of patients waiting for a hospital bed had on average certainly increased and that there would be times when there are 20 or 25 patients in the Emergency Department waiting to be get into a bed in the Hospital because there is simply nowhere for them to go. They remain in the Emergency Department until such time as a bed becomes available. Though medical care in relation to such patients is primarily provided by the doctors who would be looking after them in the general ward area rather than by the emergency doctors, the emergency doctors still need to respond to any acute changes in the conditions of waiting patients. In addition, nursing care has to be provided by Emergency Department nurses and all other enquiries and paperwork associated with a patient being in the Department comes through that Department. This has resulted in a marked increase in the amount of paperwork that has to be done within the Emergency Department. Dr Dunn also referred to the patently undesirable practice of mental health patients sometimes having to spend up to five days waiting for a bed in the Emergency Department.

4.21. Dr Dunn also told me about the incidence of patients presenting at the Emergency Department of the Hospital and then not waiting for treatment, predominantly due to long waiting times. Dr Dunn told me that generally speaking the situation at present is worse than what it was in October 2000 and mentioned the fact that there had been a decrease in the number of hospital beds in public hospitals because of an acceptance within the health system of advances in technology. However, there appear to be trends that suggest that as the population ages the need for more acute care hospital beds will increase and thereby outstrip any benefits that technological advances might confer.

5. Conclusions

5.1. The deceased was admitted to the Hospital on 20 October 2000 and died there on 26 October 2000. At the time of her admission, the deceased was suffering from staphylococcus aureus endocarditis as well as septicaemia. Emboli from the vegetation that had formed on her heart's mitral valve lodged in the deceased's brain and caused infarctions (strokes) which led to her death. I find that the cause of the deceased's death was multiple cerebral infarction due to infective endocarditis.

5.2. The deceased originally had presented at the Hospital on 19 October 2000. She was assigned a triage category of 5, which meant that she should have been seen within two hours. She was not seen for over four hours because of overcrowded conditions in the Department. I find that on 19 October 2000 she was suffering from the staph aureus endocarditis and septicaemia. The deceased had a low platelet count and this level was well-known to Dr Lincoln who treated her on the evening of 19 October 2000. I find that the low platelet count was a reflection of the deceased's staph aureus infection. Dr Lincoln did not diagnose the staph aureus endocarditis or the septicaemia and she was discharged from the Hospital. I find that the features of the deceased's presentation on 19 October 2000, namely her general debilitation, her general pain and the significantly low platelet count should have led Dr Lincoln to consider at least the possibility that the deceased was suffering from septicaemia. This should have led to the deceased being admitted to the Hospital and being placed on antibiotic treatment.

5.3. A complete blood examination was performed in respect of the deceased on 19 October 2000. The film review result of that examination was not available until the morning of the following day. I find that the results of the film review revealed positive indications of an overwhelming septicaemia. Had such a result been available to Dr Lincoln on the evening of 19 October 2000 it is more probable than not that Dr Lincoln would have diagnosed the deceased as suffering from septicaemia, that broad spectrum antibiotic treatment for the same would then have been administered and blood cultures performed in order to identify precisely the infective bacterium.

5.4. The film review results I find were available no later than 11am on 20 October 2000. I am unable to make any finding as to the time the results were appropriately considered. Certainly, no attempt was made to communicate these results to either

the deceased, her family or her general practitioner at a time before the deceased re-presented at the Hospital in the late afternoon of that day.

5.5. The deceased re-presented at the Hospital on 20 October 2000 and was triaged at 5:58pm. She was seen by Dr Wilczynska at 6:48pm. The Haematology Registrar, Dr Goh, examined the deceased at about 10pm. I find that it was then for the first time that the possibility of the deceased suffering from septicaemia was properly considered. I find that appropriate action was taken by Dr Goh, including the initiation of blood cultures and treatment with a broad spectrum antibiotic.

5.6. The deceased suffered the first of a number of strokes some time before 3:20am on the morning of 21 October 2000 at about which time the deceased's husband observed signs of the same.

5.7. The infective endocarditis was diagnosed at about 2pm on 21 October 2000 after an echocardiogram revealed the existence of a large vegetation on the mitral valve of the deceased's heart. A staph aureus infection was identified and the deceased's infection responded to treatment with staph aureus specific antibiotics.

5.8. I accept the evidence of Dr Arstall and Professor Kelly that because of the size of the vegetation that had developed on the mitral valve of the deceased's heart, and the resulting propensity for pieces of the vegetation to break off for several days after commencement of treatment, it is unlikely that had her infective endocarditis been diagnosed on 19 October during the deceased's first presentation at the Hospital, her ultimate death could have been avoided. I so find.

5.9. I find that on 19 October 2000 there was severe overcrowding of the Emergency Department of the Hospital which subjected medical staff to an unacceptable level of pressure. I find that although Dr Lincoln made no conscious decision to discharge the deceased based upon considerations of overcrowding, the fact of the matter was that his decision was made in an environment where the possibility of professional error was significant.

6. Recommendations

6.1. There are two broad areas which might be the subject of recommendation. The first relates to the issue as to whether anything can be done to prevent a misdiagnosis of the magnitude that occurred at the Hospital on 19 October 2000. I am mindful of the

fact that in all probability the misdiagnosis had no effect of the outcome in this particular matter. However, neither Dr Arstall nor Professor Kelly expressed their opinions on this in absolute terms. It is very likely that a similar presentation and history to that of the deceased will recur and a properly diagnosed patient might well be saved. Professor Kelly said that when the deceased presented on 19 October there was no hard evidence suggesting endocarditis other than the known heart murmur that reflected the deceased's valvular irregularity. However, she did say that in a patient with a known murmur and no other established source of infection, investigation for endocarditis would have been warranted. There was no evidence that the possibility of endocarditis ever occurred to any practitioner, even Dr McLean who was alive to the possibilities of the deceased developing infective complications associated with her valvular irregularity. It was on that basis that I explored with Professor Kelly the desirability for educational measures to be directed towards practitioners to enliven them to the possibility of an infective endocarditis, especially in a setting of known valve disease and signs of bacterial infection.

6.2. Professor Kelly's agreement to this at T327 was guarded insofar as a diagnosis of infective endocarditis was one that is made usually only after careful monitoring of the patient. I acknowledge that the diagnosis of infective endocarditis is not necessarily one that would immediately leap off the pages of a patient's medical history and clinical presentation. It seems to me, however, that it is a diagnostic possibility that ought to be in the forefront of a practitioner's mind when there is history of valvular disease and a presentation similar to that of the deceased, especially given the dire consequences that could flow from a misdiagnosis or late diagnosis and the rapidity with which an infective endocarditis can lead to potentially fatal complications.

6.3. In the deceased's case, the diagnosis ultimately was made by use of an echocardiogram which detected the large vegetation on the deceased's mitral valve. An echocardiogram is a straightforward, non-invasive procedure. I am bound to say that this was a diagnostic procedure that should have been utilised at an earlier stage in this case.

6.4. I recommend pursuant to Section 25(2) of the Coroner's Act that the medical profession, through their professional body, be alerted to the need to consider the possibility of the existence of an infective endocarditis in circumstances where a

patient with a known history of valvular disease presents with symptomatology of the kind observed in the deceased on 19 October 2000.

6.5. I am also concerned by the fact that when the deceased presented on 19 October 2000 her previous Queen Elizabeth Hospital medical records were not made available to the treating practitioners. The same applies to the South Australian Ambulance report. The previous medical records would have alerted the practitioners to the fact that it had been recognised that because of the deceased's valvular irregularity, there was a need for prophylactic antibiotics when undergoing surgical procedures. This may have in turn alerted them to the possibility of the existence of an infective condition associated with that irregularity. The ambulance report spoke of the deceased's inability to walk and this may have alerted the treating practitioners to a conclusion that the deceased's degree of immobility was more serious than was actually thought.

6.6. Accordingly, I recommend that the Hospital put a system in place to ensure that a patient's previous medical file be made available to treating practitioners in the Emergency Department. I recommend similarly in relation to South Australian Ambulance reports.

6.7. The availability of film review results is a difficult issue. Generally such results are not available until the day following the complete blood examination. Professor Kelly was of the following view:

> 'It is fair to say that in the vast majority of cases the film result does not add anything extra to the care of the patients. So the requirement for having the film ready at that same time that the test was done would not be a very effective strategy. Perhaps 1 in 100 or 2 in 500 cases may actually alter treatment. I think it should be available, however, within 24 hours maximum.' (T328)

Professor Kelly added that in this particular case there was enough evidence even without the film review results that the deceased required further investigation. On the other hand, Dr Lincoln acknowledged that the film review result in this case would have indicated to him the existence of an overwhelming septicaemia, a diagnosis that would undoubtedly have dictated the deceased's admission to hospital and the administration of antibiotic treatment. In addition, it would have possibly led to an earlier diagnosis of infective endocarditis, given her history of valvular disease. I do not know whether film review results can be made available any earlier than they

were in this case. No doubt the answer to that lies in manpower and cost considerations.

6.8. Given Professor Kelly's opinions, which I accept, that a film review result might only alter management strategies in very few cases and that in this particular case there was enough evidence to have warranted further investigation of the deceased's presentation in any event, there is not enough evidence before me to suggest that there is a need for more timely availability of complete blood examination film review results. However, in my view the medical profession ought to give further consideration to this issue and to give particular consideration to the necessity for film review results to be more efficiently assessed following their availability so that a result as significant as the result in this instance is communicated to discharged patients in a timely manner. I recommend accordingly.

6.9. As to the issue as to what is being done to rectify the situation in the Emergency Department of the Hospital and in Emergency Departments generally, I heard from a Ms Kae Martin who is the Director of Acute Care and Clinical Services within the Metropolitan Health Division an operational division of the Department of Human Services. Ms Martin told me that the Hospital was currently going through a redevelopment program which would include a revamping of the Emergency Department and the inclusion of a purpose built emergency extended care unit. That is planned to be operational by 2006. The Department of Human Services in recent years has limited the number of elective surgery procedures undertaken in the Hospital so that priority is given to emergency admissions. Ms Martin made the observation that elective admissions can be controlled but, in the nature of things, emergency admissions cannot be so controlled.

6.10. Other areas that Ms Martin told me were being addressed are the provision of 200 beds at the Hospital to replace 200 old beds. This is expected to be implemented some time in 2003. She also told me, however, that there had been a recent closure of beds at the Hospital several weeks prior to the inquest. 50 such beds had been closed because an elective workload had been postponed due to a shortage of nursing. When asked as to whether the closure of those beds had any impact on bed access from the Emergency Department of the Hospital, Ms Martin told me that preliminary evidence had suggested that in the few weeks prior to the inquest the number of patients waiting greater than 12 hours for admission into the Emergency Department had

increased and that there was concern that on some days of the week there would not be enough beds to support the emergency admission process. This was being addressed by the Department. Strategies were being examined in an attempt to reduce the number of closed beds in order to deal with those peaks of activity.

6.11. One of the major difficulties is supplying the Hospital with staff, in particular nursing staff. An influx of nursing staff was needed in order to reopen beds. Ms Martin told me that a South Australian nursing and midwifery strategic direction, recruitment and retention plan had been released. What was being examined here was an increase of training places within universities that are State funded and the undertaking of refresher and re-entry programs for registered nurses who have been out of the workforce. Some 250 people had been recruited back into the nursing workforce. In addition, programs were to be implemented to encourage school children to consider nursing as a career option.

6.12. In short, without going into the matter in the same detail that Ms Martin gave in her evidence, the questions of workloads within Emergency Departments in general and in the Hospital in particular, and the rectification of such issues as bed block and ambulance diversion are being addressed. However, the evidence given by those witnesses in this case who on a regular basis continue to work within the Hospital Emergency Department very much suggests that the difficulties that existed in October 2000 still exist to the same, if not to a worse, degree.

6.13. I have endeavoured to set out as succinctly as possible in these findings the evidence that relates to the systemic difficulties at The Queen Elizabeth Hospital Emergency Department and the measures that have been taken, will be taken, or might be taken to address them. The problem is not being ignored, but as at the time of this inquest, there still existed significant shortcomings in terms of overcrowding, lack of space and lack of manpower at the Hospital Emergency Department. There is obviously no quick-fix solution to these difficulties, and unfortunately, I was not especially reassured by the evidence of Ms Martin that a solution to all of these problems is imminent. The situation is little better than what it was in October 2000. If anything, a deterioration has occurred, leaving the possibility open that overcrowding and the resulting stress and pressure on medical staff might lead to the risk of a tragedy occurring at the hands of an otherwise competent medical practitioner.

I recommend that continued monitoring, scrutiny and the further development of strategies occur such that medical practitioners, nursing staff and patients be comfortably accommodated at the Emergency Department in order to reduce the risk of professional error.

Key Words: Misdiagnosis; Emergency Departments

In witness whereof the said Coroner has hereunto set and subscribed his hand and Seal the 4th day of March, 2003.

Coroner

Inquest Number 28/2002 (2841/2000)