CORONERS ACT, 2003

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 27th and 28th days of February 2006, the 1st day of March 2006, and the 12th day of May 2006, by the Coroner's Court of the said State, constituted of Elizabeth Ann Sheppard, a Coroner for the said State, into the death of Kirsten Lee Martin.

The said Court finds that Kirsten Lee Martin aged 24 years, late of 19 London Road, Aberfoyle Park died at the Flinders Medical Centre, Flinders Drive, Bedford Park, South Australia on the 26th day of February 2003 as a result of multi organ failure due to meningococcal septicaemia. The said Court finds that the circumstances of her death were as follows:

1. Sequence of events

1.1. On 20 February 2003 Ms Martin came home from work feeling unwell. When she visited her general practitioner she was told that she had a virus and was given a certificate excusing her from work for Thursday and Friday. By Sunday evening Ms Martin was feeling better and went to work on Monday and Tuesday. On Tuesday 25 February 2003 Ms Martin's mother and step-father, were out shopping and when they returned home at 11:15 am, they discovered Ms Martin had come home from work. She was in bed feeling cold and aching all over. General practitioner, Dr Barbara Clapp examined Ms Martin at her surgery at 12:30 pm. Dr Clapp noted that her temperature was elevated (39.5). Dr Clapp outlined the situation in an interview conducted a few days after Ms Martin's death as follows:

> 'I examined her urine and that was negative, so I could find no focus of her infection. I felt that she was unwell enough to warrant sending her to hospital for further

> investigation because of the lack of focus of the cause. I discussed with mum and Kirsten the possibility that it could be something serious like meningococcal but I really felt it was unlikely because she had no neck stiffness or rash or any of the signs of meningitis but I did explain to them that meningococcal could start like any other viral infection and that we should just get it checked out. So I asked them to go directly to the Flinders casualty with a letter.'
> (Exhibit C3a)

Dr Clapp explained that she didn't feel comfortable sending Ms Martin home to be watched by her parents. She provided Ms Martin's mother with a referral letter and a small card commonly known as an "alert card" for meningococcal septicaemia. I have since inspected a card of this description prepared by the Meningitis Foundation which was received into evidence (Exhibit C9, reference 1). One side of the card carries a photograph of the characteristic rash seen with meningococcal septicaemia and the reverse side depicts the range of 'meningitis symptoms' to look for in adults, children and babies. The card emphasises that the rash should be taken seriously and that a doctor should be called immediately. According to Dr Clapp, she told Ms Martin's mother that if anything like that rash appeared, it was urgent to take her daughter to hospital. Dr Clapp preferred that they not wait for it to appear, but to go directly to the hospital to be checked out before things got worse. According to Dr Clapp, she discussed how the symptoms may turn out to be just a nasty virus, but because she hadn't seen any "true flu" that year it seemed a little early in the season for it to be influenza. (Exhibit C3a)

1.2. Dr Clapp explained in the course of her interview that she expected that at the Flinders Medical Centre, Kirsten would be examined and observed, and have tests done to try to isolate the focus of her infection and her condition generally. The letter of referral was brief and to the point as follows:

> 'Thank you for seeing Kirsten with acute onset today of fever (39.5 aural) headache, whole body & leg aches and mild photophobia. There was no rash nor neck stiffness but she is a bit dry and I thought should be watched and have tests.'
> (Exhibits C3a, C6)

2. <u>First presentation to Accident and Emergency, Flinders Medical Centre</u>

2.1. Ms Martin attended the Emergency Department at the Flinders Medical Centre (FMC) shortly after 1:00 pm. Her mother obtained a wheelchair to help her daughter into the department. Ms Martin was put onto a barouche and was seen immediately by a triage nurse who took Ms Martin's temperature and noted it to be 40.1 degrees. Her

pulse rate was 120. The nurse must have recognised that Ms Martin needed an urgent assessment and within a very short time, Ms Martin was placed into a cubicle to await assessment by resident medical officer (RMO) Jatinder Rai. Before Dr Rai came to examine Ms Martin, it was obvious to Ms Martin's parents that the light in the Emergency Department was troubling their daughter. She had pulled the blanket over her head and asked for the lights to be turned off (T20).

3. Examination by Dr Rai

3.1. Dr Rai was one of two RMO's on duty in the emergency department at the time. The triage nurse entered the following data onto the computer as follows:

> 'ref GP, headache, neck stif (sic) photophobic, T 40.1'
> (Exhibit C6)

After reading the entry on the computer screen, Dr Rai attended upon Ms Martin without delay. (T53) When Dr Rai approached Ms Martin in the presence of Mr and Mrs Pilton-Stevens, she asked what the problem was. Mrs Pilton-Stevens is said to have explained that Dr Clapp thought that it might be the start of meningococcal disease and that Ms Martin should have intravenous fluids and antibiotics and be admitted. (T55) Dr Rai responded inappropriately by saying words to the effect of "do you want to do the treatment or do you want me to do it?" Dr Rai acknowledged in an interview on 3 April 2003, that this was not a good introduction and that she and Mrs Pilton-Stevens didn't get on after that. (Exhibit C7a) I find that whilst the remark by Dr Rai was uncalled for, it has no bearing upon the manner in which Dr Rai exercised her clinical judgement concerning Ms Martin's management thereafter.

3.2. Dr Rai graduated in medicine at St Marys College of Medicine at the University of London in 1998. She moved to Australia in late October 2002 when she was part way through her first year as a medical registrar. She had completed her 'house' year during 2001, which I understand is the equivalent to the work undertaken by a junior medical officer or intern. Once in Australia, Dr Rai worked for two months at the Royal Adelaide Hospital and then began as an RMO at FMC on January 21 2003. At the time of this episode concerning Ms Martin, Dr Rai had been working at FMC for about five weeks. (T51, Exhibit C7a)

3.3. Dr Rai read the referral letter from Dr Clapp and performed a thorough examination of Ms Martin which she noted in the case notes. According to Dr Rai, not

surprisingly, meningococcal meningitis was the first thing which crossed her mind when she commenced her examination. (Exhibit C7a) She specifically looked for meningeal signs such as neck stiffness and photophobia, as well as the appearance of the characteristic rash, so often highlighted in recent years in association with this disease. In evidence, Dr Rai emphasised how carefully she checked Ms Martin for evidence of rash. She acknowledged that she had prior experience with perhaps a handful of patients suffering from meningococcal meningitis. (T58, T70) According to Dr Rai, there were none of the typical meningeal signs she was looking for, apart from mild photophobia and a headache. The presenting complaint was recorded by Dr Rai as follows:

> 'Sore throat 5/7 ago, 2/7 off sick.
> Sore throat improved now general aches & pains, myalgia, joint aches, headache at back of head, mild photophobia.'
> (Exhibit C6)

3.4. According to Dr Rai, she found no sign of photophobia when she tested for it, but that Ms Martin must have complained of it to some extent because shed noted "mild photophobia" in the case notes. Dr Rai formed the impression that Ms Martin was suffering from a viral illness. She decided to investigate her by taking blood for analysis and culture as well as arranging for chest x-ray. Intravenous fluids were given to re-hydrate Ms Martin and a sample of urine was requested for "dipstick" testing. Dr Rai also arranged for Paracetamol tablets to be given to bring down the temperature and to reduce muscle aching. Dr Rai decided to speak with a senior doctor about whether antibiotics should be given and to assist in formulating a management plan. According to Dr Rai she was unfamiliar with the staff in the hospital and did not know who to get advice from. In evidence, Dr Rai explained that she was unaware who was the consultant on duty for the emergency department at that time. Dr Rai approached Dr Kleinschmidt, whom she mistakenly assumed was her registrar. She claims that he advised her to speak with a consultant and together they went to find an available consultant.

3.5. On this particular day only one of the two consultants rostered on in the Emergency Department was on duty. One was off sick and the other was busy attending another patient. Dr Rai said that it was a busy day. She ultimately discussed Ms Martin's situation with two consultants, doctors Antonio Eliseo and Andrew Doley, who were not officially on clinical duties, but were working in another area of the department on

administrative matters connected with a disaster plan. Dr Rai spoke with these two consultants before she obtained the preliminary blood screen results. When she had summarised her examination and findings she was asked by Dr Eliseo whether she had looked for meningeal signs. Dr Rai told him that "there weren't any". According to Dr Rai, she asked if she should give antibiotics and was advised "not yet", but to re-hydrate the patient, look for signs of infection, observe her for a while, treat what she found and then seek further advice. (T64-5) Dr Rai stated in evidence that she felt comfortable with her own examination technique and did not feel it necessary to ask the consultants to examine Ms Martin. Dr Rai did not tell the consultants about the parents concerns about meningococcal disease, but I am satisfied that Dr Eliseo contemplated it as a possibility nevertheless.

3.6. Dr Eliseo made some notes of the encounter with Dr Rai shortly after Ms Martin's death. The notes were relied upon to some extent when he was questioned about what occurred in an interview in September 2003 and in evidence at inquest. (Exhibit C8a) Dr Doley was not called to give evidence. Dr Eliseo graduated in medicine in 1991 and became a fellow of the Australasian College for Emergency Medicine in 1999 after working for approximately five years as a registrar in that field at FMC. From 1999 he was a consultant in the emergency department. (T114) Dr Eliseo confirmed that he and Dr Doley were not on clinical duties when Dr Rai, accompanied by Dr Kleinschmidt, approached them for advice. According to Dr Eliseo, he had the impression that Dr Rai's request was mainly to clarify what approach was taken at Flinders Medical Centre to administration of antibiotics in non-specific infections with high fever. He said that Dr Rai told him that in the United Kingdom, antibiotics would be given, but she was not sure of the situation in Australia. (T117) Dr Eliseo stated that he explained that in otherwise fit and well individuals, antibiotics were not routinely given, but he went on to question Dr Rai about whether there were features of meningitis including headache and photophobia, to which Dr Rai responded "no". Dr Rai is said to have explained to him that she did not think the patient had meningitis, but had a significant viral infection. (T120) Dr Eliseo's notes record the exchange between the doctors as follows:

> 'Working with Dr Andrew Doley in the FMC ED seminar room on FMC MCI plan on day of patient's presentation (25.2.2003)
> On a non clinical shift in the ED.
> Dr Rai (and Dr Kleinshmidt) (sic) came to us at ~ 1330-1400 hours.
> Recollection of the conversation

> Young woman with a high fever and muscle and joint pain
> No other specific symptoms
> No obvious source of infection
> I asked specifically about signs of meningitis (headache, neck stiffness, altered conscious state) – all negative
> Dr Doley asked about presence of a rash – negative
> Specific question asked "should I give antibiotics at this point"
> Combined advise was for IV fluids, paracetamol and take routine bloods. Observe patient for a period of time – ie wait for blood results prior to giving antibiotics
> Advised that the cause of the patients high fever may be viral in origin
> Not asked about disposition
> Not asked to review the patient
> No further contact with the patient'
> (Exhibit C8a)

I find that Dr Rai spoke initially with Dr Kleinschmidt about Ms Martin and that he accompanied Dr Rai when she sought advice from the two consultants.

3.7. At approximately 2:15 pm, Dr Rai read the results of one of Ms Martin's blood tests via the computer screen in the Emergency Department. No abnormalities were detected apart from mildly raised white cell count and a mildly raised neutrophil count which suggested to Dr Rai a low grade bacterial infection or viral infection.

3.8. Meanwhile, Ms Martin had provided a sample of urine as requested. The urine dipstick test which is a very crude indicator of urinary tract infection disclosed a small number of white cells and a small amount of blood. During the course of Dr Rai's examination of Ms Martin she claims to have noted some tenderness over the kidney area which suggested to her that there may have been a possible urinary tract infection. Although there were none of the usual presenting features such as frequency and burning, often associated with urinary tract infection, Dr Rai formed the view that Ms Martin probably had a urinary tract infection which did not fully account for her symptoms, but may have contributed to them.

3.9. Dr Rai explained her reasoning as follows:

> 'I actually had the test results came back an hour or so later. I still had the impression that she may have had a viral illness and that she also may have had a urinary tract infection that was contributing towards the way she was feeling by the fact that she had some right renal angle tenderness, as in direct overlying the kidney area on the right. Marginally raised white cell count and minimally abnormal urine dipstick. I thought she may have had an incidental urinary tract infection as well that might have been contributing towards the fever as well, but not as the major cause of her illness.' (T61)

3.10. Results from the blood culture which might identify the particular organism responsible for the infection were not available for approximately 24-48 hours, hence the dilemma about whether to give antibiotics. As it turns out, the results became available at 9.27 am, the next day, by which time Ms Martin had died. (T60)

3.11. Ms Martin was kept under nursing observation in the Emergency Department until around 4:00 pm. During some of this time, Dr Rai was entering her notes into Ms Martin's case notes. She noticed that Ms Martin had been able to walk with her mother's help to the toilet after being asked to provide a urine specimen. At 3:25 pm Ms Martin's temperature was marginally improved at 39.2 degrees. At 3:40 pm she was given 400 mg of Ibuprofen, an anti inflammatory medication. Because the medication needed to be given with food and Dr Rai noticed Ms Martin eat a small amount of a sandwich and drink some fluid. Dr Rai claimed that when she spoke with Ms Martin, she was told that she felt much better. In Dr Rai's view, she had not seen anything to suggest that Ms Martin's condition was deteriorating. Dr Rai claims to have been unaware of any ongoing discomfort which Ms Martin may have been having from light. She explained in evidence that unless she was able to demonstrate a moderate level of photophobia upon examination, she would not have attached much significance to this finding. (T66 -67)

3.12. At about 4:00 pm Dr Rai considered the question of allowing Ms Martin to go home. According to Dr Rai, she discussed her decision with Dr Kleinschmidt, whom she described in evidence as her registrar. She then recorded in the notes that she had discussed the question of discharge with a senior doctor. In a statement given by Dr Alexander Kleinschmidt in October 2003, a different version of events was given as follows:

> 'At the time of this incident, I was not the Senior Registrar, I was a Resident Medical Officer employed part-time in the emergency department. My average working hours in that department are two days a week. Outside of this I work two days a week in general practice. In regards to who was senior between Dr Rai and myself, it would be a matter of dispute, as she was almost senior to me at that time. With this case I do distinctly remember asking Dr Rai to go and see a consultant to obtain a consultant's opinion on the case, as I thought this was beyond my means and a consultant definitely needed to be at least talked to about the case.'

Dr Kleinschmidt went on to state that he had very little recollection of events concerning that incident apart from asking Dr Rai to seek an opinion from the consultant. He claims to have no memory of accompanying Dr Rai when she went to

speak with the two consultants. Dr Kleinschmidt maintained that he himself did not examine Dr Rai's patient. The tone of the statement certainly suggests that Dr Kleinschmidt was uncomfortable making decisions concerning Dr Rai's patient. (Exhibit C4a)

3.13. When Dr Rai was asked why she didn't go back to the consultants to discuss discharge, she gave the following explanation:

> 'Because I had also discussed the case with him and he's my immediate senior, or he was my immediate senior'. (T69)

I am prepared to accept that Dr Rai did have some type of discussion with Dr Kleinschmidt concerning her decision to let Ms Martin go home, but that because of the passage of time, Dr Kleinschmidt has no recollection of this. But given the state of the evidence, I am not prepared to find that Dr Kleinschmidt knowingly concurred in the decision to allow Ms Martin to leave the hospital. Regardless of whether there was such a discussion, I find that Dr Rai was unwise not to go back to the consultants for further advice. Because Dr Rai was in a relatively unfamiliar environment, she should have erred on the side of caution, rather than assuming that Dr Kleinschmidt was a senior doctor without making some form of inquiry about that. It should have been plain to Dr Rai when she first discussed the case with Dr Kleinschmidt, that he was not a senior doctor and that he was not assuming any responsibility for the management of her patient. If Dr Rai was more experienced, she may have realised that the perceived improvement in Ms Martin's condition was marginal and that the paracetamol and two litres of intravenous fluids, may have been temporarily masking what was really happening. (T234)

3.14. Mr Pilton-Stevens claimed that when Dr Rai approached them to discuss releasing Ms Martin, she said "You are not as sick as you think you are Kirsten, all have you is a urine and viral infection". (Exhibit C2a, T25) Whilst Dr Rai disputed having said this, I find that she did say words to that effect. Dr Rai acknowledged that when she was asked by Mr and Mrs Pilton-Stevens if their daughter had meningococcal meningitis, Dr Rai responded "at this stage, no". Dr Rai claims to have told them that if after arriving home she should feel any worse, or failed to improve, or developed a rash, they shouldn't hesitate in returning. (Exhibit C7b) Mr Pilton-Stevens said that he could not recall being given that advice, but I accept that in general terms some verbal advice was given about the need for Ms Martin to return to hospital if her

condition failed to improve. Unfortunately this advice was not noted in the medical notes and nothing was provided in writing to Ms Martin or her family about what if anything they should be looking for. I find that as a result of what Dr Rai told them, Ms Martin's parents were left with the impression that Kirsten was safe to return home and that she was not suffering from the serious infection that they initially feared. Mr Pilton-Stevens conceded in evidence that even though he and his wife had been given an alert card by Dr Clapp with information about meningococcal meningitis, he didn't look at it. (T41)

4. Events occurring following release from Flinders Medical Centre

4.1. Mr Pilton-Stevens and his wife took Ms Martin home shortly after 4:00 pm. She needed help walking and getting into the car. She told them she felt "blood horrid". (T25) Over the next few hours, Mr Pilton-Stevens started to get worried and didn't know what to do. He asked a neighbour who was a doctor, to come and look at Ms Martin. The neighbour is said to have spoken with Ms Martin and checked for marks on her body. The neighbour also is said to have tried to contact the night registrar at the Flinders Medical Centre to discuss Ms Martin but without success. According to Mr Pilton-Stevens, the neighbour warned him to let her know if he found any marks on Ms Martin's body. Some time later Ms Martin took her pyjama pants off because she felt hot and when she turned over, Mr Pilton-Stevens noticed a rash on her left upper leg. He did not appreciate the significance of the rash at first and asked Kirsten how she developed it, thinking that it was as a result of an injury. When Kirsten said that she did not know how she got the rash, Mr Pilton-Stevens ran to his neighbour's place to report what he had seen, at which stage the doctor advised him to take her straight to FMC. (Exhibit C2a)

4.2. Second presentation to Flinders Medical Centre

A period of about 50 minutes elapsed between the observation of the rash and attendance at FMC. At 9:20 pm Ms Martin presented to the Emergency Department and was quickly assessed by Dr Tan who immediately recognised the rash and history as indicative of meningococcal septicaemia. He admitted Ms Martin to the Intensive Care Unit for aggressive management. At 9:40 pm, intravenous ceftriaxone as well as benzyl penicillin and naroban were administered. Ms Martin's brothers were called to the hospital and each member of the family were administered antibiotics as a precautionary measure. The family was in attendance until around 11:00 pm at which

time they returned home for some rest. At 1:00 am when the parents telephoned the Intensive Care Unit they were told that Ms Martin was stable. Thirty minutes later they received a call to say that she was deteriorating. Mr and Mrs Pilton-Stevens returned to the hospital and were told that she had stabilised once more, so they returned home. At 3:15 am when Mr Pilton-Stevens telephoned to enquire on progress, they were told that Ms Martin's lungs had collapsed and that she had pneumonia. They returned to the Flinders Medical Centre and saw that she appeared to be comfortable but was on life support. They went home again and at 5:15 am were notified by staff in the Intensive Care Unit that Ms Martin was unlikely to survive. When they arrived back at the hospital at about 5:35 am they were informed that Ms Martin had passed away a short time before at 5:20 am. It is very regrettable that the staff were unable to facilitate the presence of Kirsten's family at her bedside at the time of death. I make supplementary remarks about this aspect of Ms Martin's management towards the conclusion of these Findings.

5. Cause of death

A post mortem examination was not conducted. Blood culture results available at 9:27 am of the morning of Ms Martin's death, confirmed that Ms Martin had developed meningococcal septicaemia which resulted in multi-organ failure and death. I find that Ms Martin's death occurred in accordance with this explanation. (Exhibit C6)

6. How might Ms Martin been dealt with, if she had been seen by Dr Eliseo?

6.1. Dr Eliseo acknowledged that in an otherwise fit, healthy adult who presents with a high fever and generalised aches and pains, antibiotics would not routinely be administered. (T131) Whilst conceding that he was speaking with the benefit of hindsight, Dr Eliseo stated that if he had been managing the patient, Ms Martin would have been admitted overnight for ongoing observations. Having read the notes of Dr Rai's examination, Dr Eliseo attempted to predict how he might have handled the situation as follows:

> 'I suppose the thing - the one thing I would have done, and most senior staff would have done, is this lady wouldn't have gone home. As to whether I would give antibiotics, I don't know I'm sorry. I don't know if I would give antibiotics on that alone but to me this lady appears significantly unwell and she should be admitted at least for observation until we get the results of - like the blood culture results or just have a chance to observe

> her for a more prolonged period of time. Because people either - we have people come in with temperatures over 40, it's not common but it's a weekly occurrence and they are routinely admitted, even if they're - the last one I saw was probably three weeks ago, temperature over 40, but he was sitting up in bed having his family brought in, a hamburger and he was walking around the department. This man looked well but the temperature is so high that I wouldn't send him home. Now I had a very good feeling this person had a viral infection but I still wouldn't send him home because there is that chance that things will progress. So we admitted him overnight. The next morning he was better. He went home. And that's what I think I would of done different. See that was the significant difference between our care, was that I think if a senior doctor had got involved in this lady's care that she would have been kept in overnight.' (T125-126)

6.2. According to Dr Eliseo, he regarded Dr Rai as a very good RMO. (C8) However when he was questioned about Dr Rai's diagnosis of urinary tract infection, he stated as follows:

> 'But this case is not one of a UTI. This girl doesn't have UTI. No, even at the time this girl didn't - and I do not think Dr Rai thought she had a UTI, even though she treated her for a UTI I don't really think - I am sure she wouldn't have thought she had a UTI either. It would be unusual to have a woman who is - has that high a heart rate and that high a temperature with a simple urinary tract infection.' (T157-158)

6.3. I find that Dr Rai, through inexperience, did consider urinary tract infection as one of Ms Martin's presenting problems. After all, Dr Rai conceded this in evidence and nominated it as the provisional diagnosis in the case notes. Additionally, Dr Rai ordered Trimethoprim tablets to be provided upon her release. This drug is used specifically for acute urinary tract infections (MIMS 1996-2006).

6.4. Dr Eliseo emphasised that to his knowledge, the scientific references to meningococcaemia, focus mainly upon the typical rash as the trigger for administering antibiotics. (T127) He added:

> 'Unfortunately that's the clue that nearly every medical practitioner uses. Is it right? Possibly not, but it's the clue that everyone does use currently; as soon as you see the rash that's when you give antibiotics. (T133)

6.5. According to Dr Eliseo, current thinking concerning atypical cases is that by giving antibiotics, one may produce more harm than good, because of the possibility of adverse drug reactions and the development of significant bacterial resistance to antibiotics. (T135) I accept that Dr Eliseo's views reflect those of a great many medical practitioners in this State and probably elsewhere. Dr Eliseo stated that as a result of this episode with Ms Martin, he has now adopted a cautious approach to his practice in which he refuses to give advice to junior doctors unless he sees the patient

himself. If he is unable to do that, he advises the junior doctors to seek assistance from another consultant. (T164)

6.6. I find that if Dr Eliseo had gone to Ms Martin's bedside himself he may have formed a more serious view of her condition based upon his additional training and experience. I accept that it is unlikely that he would have allowed her to go home when she did. It would have been relatively easy for either Dr Doley or Dr Eliseo to see Ms Martin, regardless of whether they were officially on clinical duties or not.

6.7. I find that if Ms Martin was kept under observation this may not have altered the tragic outcome, but it would have enabled staff to detect a deterioration in her condition, providing that they were looking carefully and frequently for the rash.

7. Opinion of microbiologist from Flinders Medical Centre

7.1. Dr David Gordon is the head of the microbiology and infectious diseases department at Flinders Medical Centre and held that position at the time of Ms Martin's death. Dr Gordon explained the facilities involved in providing blood culture results at the hospital in February 2003. According to Dr Gordon, results can take between 12 hours and 7 days in some cases, depending upon the type of bacteria involved. (T172) When a positive result is obtained, he or another infectious diseases specialist is contacted by the laboratory technicians to discuss the result. The specialist examines the culture to identify the bacteria. Having done this, the patient is tracked down, either in hospital or elsewhere to ensure that they are receiving the correct antibiotics. Dr Gordon explained that usually, 24 hours is required to obtain a result, but that in Ms Martin's case, according to computer records, the results were conveyed to medical staff at 9:30am only a few minutes after they became available. I am satisfied that the laboratory has in place a satisfactory system for communicating results at the earliest opportunity, but obviously in Ms Martin's case it was simply too late.

7.2. Dr Gordon was asked about the availability of other diagnostic tools for earlier detection of the disease and he explained that lumbar puncture is one option which can provide helpful indicators of meningitis within an hour or so of the procedure. But Dr Gordon emphasised that where the patient has meningococcal sepsis without meningitis, as was the situation with Ms Martin, the lumbar puncture result would be normal. (T177) A potential alternative blood test according to Dr Gordon, is one

involving the Polymerase Chain Reaction. Unlike blood cultures, this test can be conducted on a sample of blood taken after antibiotics have been administered. Unfortunately, the capacity to conduct the test is limited and presently it can only be done during normal working hours and over a period of four to six hours, plus transport time. (T185)

7.3. As to the role of antibiotics generally, Dr Gordon concurred in the approach articulated by Dr Eliseo. In Dr Gordon's opinion, there needs to be a reasonable clinical suspicion of meningococcal disease to justify administration of antibiotics. He acknowledged the dilemma created between withholding drugs during the early stages of the undiagnosed condition on the one hand, and the risks associated with toxic reaction to the drugs and bacterial resistance on the other hand. (T179) According to Dr Gordon, there is debate in the scientific literature about whether antibiotics improve outcome, but nevertheless, where there is a suspicion of the disease, he accepts that antibiotics are recommended. Dr Gordon was reluctant to say what he would have advised Dr Rai to do if he was given the information as recorded in Ms Martin's notes, but he believes that he would have been uncomfortable about Ms Martin going home. (T181) The major problem, according to Dr Gordon, is that there are thousands of patients who present with non-specific symptoms and it is not easy to distinguish the very small number who have meningococcal disease. (T182)

8. Overview of first presentation to FMC, Accident and Emergency Department

8.1. An opinion was sought from Associate Professor Anthony Brown from the Department of Anaesthetics and Critical Care, University of Queensland, concerning Ms Martin's management during her first presentation at FMC on the afternoon of 25 February 2003. The final presentation at 9:20 pm, is less relevant to the inquest, because the situation by that stage was perilous. I am satisfied that the intensive care team did everything reasonably possible to manage the crisis, but because of the fulminant nature of the disease, it was too late to alter the outcome.

8.2. Associate Professor Brown graduated in Medicine in Bristol, United Kingdom, in 1979 and since that time has accumulated a number of qualifications and experience, particularly focussing upon Accident and Emergency Medicine. He is currently a Senior Specialist in the Emergency Department at Royal Brisbane Hospital and also practices at the Prince Charles Hospital. Since 1995, he has been Associate Professor

with the University of Queensland in the Division of Anaesthesiology and Critical Care, representing emergency medicine. (T197) A perusal of Associate Professor Brown's curriculum vitae indicates that he has for many years been heavily involved in medical training programmes and has been recognised for excellence in teaching. (Exhibit C9) His clearly articulated answers to questions during evidence provided confirmation that he is an impressive communicator.

8.3. Professor Brown provided a report to the Coroner in which he set out the sequence of events and expressed opinions concerning various aspects of Ms Martin's management. Firstly, Professor Brown was encouraged by Dr Clapp's handling of the matter to believe that the awareness programs concerning meningococcal disease have succeeded. He explained that attempts to raise the profile of this serious disease saw general practices and emergency departments around Australia feature posters depicting the typical rash and other information to assist in diagnosis of meningococcaemia. Dr Rai acknowledged that a poster of this type was featured in the FMC Emergency Department at the time. Professor Brown explained that where the typical rash is identified in feverish unwell patients, all doctors have been encouraged to presume the diagnosis and give intravenous antibiotic treatment, preferably after taking blood for culture. (Exhibit C9)

8.4. Professor Brown considered that Dr Clapp's referral letter, whilst not specifically mentioning meningococcal disease, would be understood by practitioners as referring to that disease. I find that the referral letter communicated Dr Clapp's suspicion that Ms Martin may have meningococcal disease, but that in the absence of rash or meningeal signs, she was unsure.

8.5. In evidence at Inquest, Professor Brown summarised the challenges for practitioners when trying to diagnose the illness as follows:

> 'Yes, meningococcal septicaemia is a septicaemia, or blood poisoning from the meningococcus or Neisseria meningitidis. It is the common cause of fatal infection in children and young adults and one of, I guess, the problems with meningococcal septicaemia is that, unfortunately, the name of the organism 'Neisseria meningitidis', the meningococcus sounds like meningitis, indeed for many, many years there has been confusion between the meningococcal septicaemia and meningitis and the reason I stress that is that it is possible to have meningococcal septicaemia without signs of meningitis. The importance is that to diagnose meningococcal septicaemia it is not necessary for a patient to present with meningitis, indeed in case studies roughly one in five to one in three cases of meningococcal septicaemia do not have signs of meningism and one of the

> concerns is that when a doctor is attempting to exclude meningococcal septicaemia they look for meningitis and in the absence of finding meningitis, are reassured that this is not meningococcal septicaemia..' (T198-199)

8.6. Professor Brown explained that meningococcaemia is difficult to diagnose in the absence of the typical rash, because it may mimic common viral infections and the 'flu. In his view, maintaining a high-index of suspicion for meningococcaemia is essential. Professor Brown stated that meningococcal septicaemia is the most feared infection in medicine. (T223) He strongly argues that antibiotics should be given if there is no other good alternative diagnosis, even in the absence of a typical rash or shock. (Exhibit C9) According to Professor Brown, the critical failing in Dr Rai's examination of Ms Martin was her concentration on absence of rash and signs of meningitis. He did not suggest that Dr Rai was departing from what many other practitioner would have done in the circumstances. He readily acknowledged that many practitioners continue to place too much reliance on rash and meningeal signs, when trying to diagnose meningococcal disease. (T199) Professor Brown summarised his review of Dr Rai's management of her patient as follows:

> 'In summary, I find no fault with Dr Rai's intent, motivation and diligence to do the right thing caring for Ms Martin. However, Dr Rai inadvertently made unrecognised errors of judgement that included excluding meningococcal meningitis by the absence of neck stiffness, excluding meningococcaemia by the absence of rash, accepting an unsubstantiated trivial alternative diagnosis, considering the patient had improved when she really had not and not actually requesting that senior ED staff see and assess Kirsten themselves.'
> (Exhibit C9, page 10)

8.7. Professor Brown elaborated on the diagnosis of urinary tract infections as follows:

> 'The diagnosis of UTI was not supported by any of the common symptoms of urinary frequency, burning dysuria or suprapubic or loin pain. In addition, the urine dipstick was barely positive, showing only trivial changes for blood and leucocytes, and more relevantly was negative for protein and nitrites, which would also be expected to be positive in a serious urinary infection.'
> Exhibit C9, page 9)

8.8. Professor Brown explained that the typical petechial or purpuric, non-blanching rash is seen in the majority of patients with meningococcal septicaemia (meningococcaemia) and for this reason, it is regarded as the "hallmark" indicator for antibiotics to be given immediately where the patient is feverish and unwell. But he stresses that the absence of a rash "may not be used to exclude the diagnosis." In his view, the literature demonstrates that:

> 'A typical petechial or purpuric, non-blanching rash is seen in the majority of patients with meningococcal septicaemia (meningococcaemia), with 70% of 23 cluster deaths in New Zealand in 1998 showing a typical rash, and 55% of all Queensland meningococcal cases in 2000.'
> (Exhibit C9)

8.9. Professor Brown attached more significance to the raised white cell count than Dr Rai did. In his view, a raised white cell count, particularly with the mild neutrophilia can be a potential indicator of early septicaemia. He said that neutrophilia is characteristic of a bacterial rather than a viral infection and should have been taken more seriously. An alternative possible diagnosis of urinary tract infection in Professor Brown's view was not supportable by any of the common measures used to make that diagnosis. According to Professor Brown, Ms Martin should have been seen by a more senior consultant, she should not have been allowed to go home, and she should have been administered intravenous penicillin. (Exhibit C9, T206) I accept Professor Brown's opinion concerning the first two matters. As to the question of giving antibiotics, this is a more vexed question which requires more detailed analysis.

8.10. Professor Brown explained that it is not possible to say whether Ms Martin would have lived if she had been given antibiotics at her first presentation. But he accepts that generally the thought is that the earlier they are given, the better the outcome. If one waits for signs of shock, it has often reached a very serious stage. According to Professor Brown, Ms Martin may have been in early stages of shock when she presented to FMC. (T211-212)

8.11. In evidence, Professor Brown readily acknowledged that Dr Rai's initial examination was exemplary but that when she did not find a rash or signs of meningitis, she "ceased to have meningococcal septicaemia as a high priority. What she then did was to look for an alternate diagnosis to account for the illness." (T204) According to Professor Brown, Dr Rai had been failed by her senior colleagues when she sought their advice. In his opinion, which I accept, once advice was given by the consultants, they became responsible for the advice, regardless of whether they were officially on clinical duties or not. (T208-209)

8.12. In Professor Brown's view, because senior emergency doctors are so busy, it is important to "single out the cases where the diagnosis potential is critical". (T209) He explained that patients, presenting with chest pain would be an example of this

and patients like Ms Martin also fit this description. I note that this approach is in keeping with the triage priority afforded to Ms Martin when she first presented.

8.13. When commenting upon the undesirability of overuse of antibiotics in patients presenting with high fevers, Professor Brown made the point that treatment for meningococcaemia is discrete and not requiring broad spectrum antibiotics which might be more commonly linked to problems with desensitisation, for example in the treatment of ear and throat infections. According to Professor Brown, the meningococcal bacteria known as *Neisseria meningitidis group B,* responds specifically to penicillin. Because it is so sensitive to penicillin, in Professor Brown's view, it makes eminent sense to administer the penicillin at an early stage where one suspects meningococcaemia. (T233) Once blood culture results are available confirming or excluding that diagnosis within 24 – 48 hours, the penicillin can be abandoned if necessary. Clearly where a misdiagnosis will have a devastating outcome if penicillin is not given, this approach is compelling.

8.14. In Professor Brown's view, Dr Eliseo did not have the requisite high level of suspicion that he ought to have had because he too, was focussing too much on the more typical presentation of the disease. According to Professor Brown, it is well known that once the rash appears and is accompanied by signs of septicaemia, the chances of survival are dramatically reduced. (T200) I accept the force of Professor Brown's argument that when balancing the perceived risk of treatment with the benefit, the risk of penicillin is small.

8.15. Professor Brown emphasised in evidence, that because of the nature of the disease, even if antibiotics had been given at the earliest opportunity in this case, the outcome may not have been any different. In his opinion, if Dr Clapp was worried about meningococcal disease, she should have given antibiotics. Penicillin is available free of charge to general practitioners for this purpose and they should be using it according to Professor Brown. (T231) In the circumstances I am prepared to find that Dr Clapp's management of the situation was appropriate. She clearly had a concern that Ms Martin might have the disease but preferred that she be dealt with in a hospital setting without delay.

9. Recent research in early diagnosis of meningococcal disease

9.1. On 4 February 2006, the Lancet Medical Journal (online, vol. 367) published the results of research conducted in the United Kingdom concerning children and adolescents presenting with meningococcal disease. It received some publicity in the media at the time and according to Professor Brown is an important development in early diagnosis of the disease. (T200) The research focussed upon the symptoms occurring before admission to hospital as follows:

> 'In all age groups, the first specific clinical features were signs of sepsis – leg pain, abnormal skin colour, cold hands and feet, and, in older children, thirst. Parents of younger children also reported drowsiness and difficulty in breathing (usually described as rapid or laboured breathing) and occasionally diarrhoea, at this stage. Most sepsis symptoms occurred before the first medical contact.
>
> The time-window for clinical diagnosis was narrow. Most children had only non-specific symptoms in the first 4-6 hours, but were close to death by 24 hours. Only 165 (51%) children were sent to hospital after the first consultation. The classic features of haemorrhagic rash, meningism, and impaired consciousness developed late (median onset 13-22 hours). By contrast, 72% of children had early symptoms of sepsis (leg pains, cold hands and feet, abnormal skin colour) that first developed at a median time of 8 hours, much earlier than the median time to hospital admission of 19 hours.'

9.2. The article summarised the effect of this study as follows:

> 'Classic clinical features of meningococcal disease appear late in the illness. Recognising early symptoms of sepsis could increase the proportion of children identified by primary-care clinicians and shorten the time to hospital admission. The framework within which meningococcal disease is diagnosed should be changed to emphasise identification of these early symptoms by parents and clinicians.'
> (Exhibit C10a)

9.3. Professor Brown emphasised that this research has direct implications for patients like Ms Martin. (T203) It is the type of information which general practitioners and emergency doctors need to concentrate on when struggling with early diagnosis. In evidence, Dr Gordon referred to the article and explained that FMC has already taken note of this study and has incorporated the symptoms into the Emergency Department's handbook. (T195)

9.4. The article recognised that the importance of the classic "non-blanching rash" is the "central message of most public education campaigns about meningitis". This most common classic feature was seen in only 42 – 70 % of cases studied. Meningism was more common in older children with about half of these showing photophobia. The

most common late feature was "confusion or delirium, also occurring almost half the children (43 – 49%). Between 7% and 15% were unconscious by the time they were admitted to hospital." The study demonstrated that taking account of the "three sepsis symptoms of leg pain, abnormal skin colour, and cold hands and feet, 72% of children of children had one or more that was first noticed at a median time of 8 hours, which was 11 hours sooner than the median time of 19 hours from onset to hospital admission."

9.5. Professor Brown emphasised the importance of publicising this new data and having it included on "alert" cards and other material. (T201) I endorse Professor Brown's argument that there needs to be a follow-up to the education campaign for diagnosis of meningococcal disease to incorporate the results of this important research. In particular, general practitioners and emergency departments ought to have emphasised that when performing examinations of patients presenting with non-specific fevers and myalgia that they should specifically question the patients about whether they suffered cold hands and feet, leg pain, or presented with abnormal skin colour. (T202) The Lancet article acknowledges that:

> 'Early diagnosis of rare but important diseases outside hospital is extremely difficult. If diagnostic decisions are driven by clinical observations derived from hospital case-series, rather than the course of symptoms before admission, a diagnostic delay in inevitable. Further research into the diagnostic value of clinical symptoms and signs in serious childhood infection before admission to hospital is necessary to enable clinicians working in primary care to make an accurate assessment and an early diagnosis.'

9.6. I concur in that observation and encourage research groups to concentrate on ways in which early diagnosis of the disease might be made. In a commentary in the Lancet Medical Journal about the recent research, it is stated that:

> 'The rapid onset of disease, the fulminant course of some infected patients, and the mortality and morbidity are all reasons why this infection is so dreaded. Meningococcal disease continues to be a major worldwide health problem and is the most common infectious cause of death in children in many developed countries.
> '… initial misdiagnosis often delays appropriate treatment'.
> (Exhibit C10b)

10. <u>Failure to ensure that Ms Martin's family was present when she died</u>

10.1. Professor Brown commented in his report that there appear to have been some flawed communication during the final stages of Ms Martin's life when she was seriously ill in the intensive care unit, which resulted in her family being absent at the time of

death. According to Professor Brown, "the unit should have been able to recognise the inevitable fatal outcome in time to allow Kirsten's mother and step father, and even her brothers, to be physically present at her bedside when she actually died." I agree with Professor Brown's remarks, but accept as he did, that following Ms Martin's death, the Director of the Emergency Department, Dr Diane King, took appropriate steps to address the shortcomings of staff and initiated direct communication with Ms Martin's family herself.

11. Changes within the Emergency Department of Flinders Medical Centre since February 2003

11.1. Dr King provided a statement in which she outlined changes made in her department since February 2003. An Emergency Extended Care Unit (EECU) commenced in February 2003, described as a short stay unit where patients can be admitted for up to 24 hours. After 24 hours, the patient is either discharged or, if the patient requires further care, they are admitted to a ward. At the time of Ms Martin's death, the Emergency Department was in the process of developing policies to deal with circumstances in which patients should be admitted to this new unit. At that time, patients presenting with a fever of unknown origin were not admitted to the unit, however after Ms Martin's death, the issue was reviewed. Patients who fit that description may now be admitted to the EECU for further observation, if the treating doctor determines that this should happen. (Exhibit C11)

11.2. Professor Brown explained that one of the benefits of having the ability to admit patients to this type of unit in the emergency department, is that they would not have to convince members of another department of the diagnosis and the merits of admitting a patient under their care. (T229) It therefore removes that degree of formality in the admission process and provides an opportunity of giving extended periods of observation to those patients who clearly require it.

12. Advice given to junior doctors

12.1. In addition to the revision of policies for use of the EECU, there has also been some change to procedure in the FMC Emergency Department following the death of Ms Martin about advice given by consultants to junior doctors. According to Dr King:

> 'Following the death of Kirsten Martin, all emergency consultants were advised that if they give advice on the treatment and management of a patient to a junior doctor, they must first see that patient. If they are unable to see the patient because they have other duties or are not physically in the hospital, then they are to advise the junior doctor to seek the assistance of a senior doctor who is working in the Emergency Department.' (Exhibit C11)

12.2. The changes described by Dr King to the Emergency Department at Flinders Medical Centre are sensible. Had the facility been available when Ms Martin first presented, it may have resulted in earlier detection of the rash and the administration of antibiotics and aggressive treatment. However on the available evidence, I am unable to determine whether it would have altered the outcome. Unless the medical profession at large adopts the approach advocated by Professor Brown, one can easily contemplate a repetition of these tragic events. I do not underestimate the complexity of the dilemma here.

13. Staffing issues in the Emergency Department, FMC

One issue which emerges from this Inquest concerns the way in which RMO's and other staff in the emergency department are informed about who they are to consult for advice. Given the high turnover of inexperienced junior doctors and other practitioners who may work in emergency departments, it is essential that they have a clear understanding of the 'chain of command'. It is particularly important that doctors who are relatively new to the country like Dr Rai, have information prominently displayed telling them who is on duty, listing the names of the RMO's, registrars and consultants. Where there are staffing shortages, contingency plans should be established which deal with the situation.

14. Recommendations

In accordance with the provisions of Section 25 (2) of the Coroner's Act 2003, the following recommendations are made in anticipation that they might prevent or reduce the likelihood of or recurrence of an event, similar to the event, the subject of this Inquest.

1. That the Minister for Health do what is reasonably necessary to facilitate arrangements in emergency departments of public and private hospitals such as those introduced at the Flinders Medical Centre in 2003, to enable suitable

patients to be admitted for extended care and observation in their respective departments for periods of up to 24 hours.

2. That the Minister for Health take the necessary steps to ensure that the Directions of emergency departments of public and private hospitals produce lists of the medical practitioners rostered on duty, together with clear descriptions of their status and contact details. These lists should be prominently displayed in their respective departments and kept up to date.

3. That the Minister for Health together with the Medical Board, develop a strategy whereby medical practitioners in emergency departments and in general practice, are alerted to the less typical presentation of meningococcal disease and the results of the recent English studies on early diagnosis of the disease.

4. That the Minister for Health consult widely with the Directors of emergency departments and infectious diseases specialists for the purpose of reviewing the current approach to administration of antibiotics in cases of suspected meningococcaemia.

Key Words: Emergency Departments; Hospital treatment; Meningococcal septicaemia;

In witness whereof the said Coroner has hereunto set and subscribed her hand and

Seal the 12th day of May, 2006.

_____

Coroner