OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Fiona Jane DEE**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Brisbane
FILE NO(s):	COR 716/05(7)
DELIVERED ON:	22 March 2007
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HEARING DATE(s):	1 September 2006, 9, 10,11 & 12 October 2006
FINDINGS OF:	Ms Christine Clements, Deputy State Coroner
CATCHWORDS:	CORONERS: Inquest – elective caesarean, spinal anaesthesia. Cerebrospinal fluid leak, subdural haematoma, query epilepsy, query cardiac event, Tegretol, hyponatremia, epidural patch, postural headaches

REPRESENTATION:

Mr Craig Chowdhury of Counsel– appearing to assist the Coroner

Mr G McGuire of Counsel– representing the family; instructed by Bell Miller Solicitors

Mr A Luchich of Counsel – representing Mr Kahler, Dr W Kelly & Dr Chinthamuneedi instructed by Flower & Hart Lawyers

Mr R Ashton of Counsel – representing Sunnybank Hospital; instructed by Minter Ellison Lawyers

Mr D Tait of Counsel – representing Drs M O'Brien, Singh, M Coroneos, C Jackson & M Cleary; instructed by Blake Dawson & Waldron

Ms C Elder of Counsel representing the Wesley Hospital

The *Coroners Act 2003* provides in s45 that when an inquest is held, the coroner's written findings must be given to the family of the person who died and to each of the persons or organisations granted leave to appear at the inquest. These are my findings in relation to the death of Fiona Jane Dee. They will be distributed in accordance with the requirements of the Act and a copy placed on the website of the Office of the State Coroner.

Introduction

Scott Dee was married to Fiona Jane Dee. They had two children. The first child was born at Sunnybank Private Hospital on 7 October 2002. There was a prolonged period of labour and a subsequent caesarean section was performed under epidural anaesthesia.

Mrs Dee was thirty two years old, fit and healthy when she entered Sunnybank Hospital on 7 March 2005 to deliver her second child. Her treating obstetrician on both occasions was Dr Michael O'Brien and the anaesthetist was Dr Colin Jackson. The pregnancy proceeded without any problem. Mr Dee told the inquest that they expected the second birth to be a caesarean section in accordance with advice they had received.

Mrs Dee's second child was delivered by caesarean section with a spinal block anaesthetic.

Review of Evidence

Mrs Dee's husband, **Scott Dee** gave evidence. His recall of events was limited to some extent but he had documented his recollection at an earlier time and relied on that document. However, where there is a difference in recollection which has been contemporaneously noted in the hospital record, I have regard to that hospital record. Mr Dee appeared to be careful in telling the court what he could remember and was quite open in saying he could not recall particular information. He was understated and quiet in his presentation. His evidence is summarised as follows.

He said he was unaware that there was any difference between an epidural anaesthetic and a spinal block. He thought it to be the same procedure as the epidural which had occurred at the first birth.

According to Mr Dee, the anaesthetist, Dr Jackson came into the ward and spoke with Fiona and her husband prior to the procedure commencing. Mr Dee does not recall the details of this discussion. He told the inquest that he could not recall the risks of the procedure being explained at this time. He was then shown the particular consent form and acknowledged it had been signed.[1] Mr Dee was present in the operating theatre during the anaesthetic and birth. Fiona was leaning over a pillow and moving back and forward as directed by Dr Jackson to facilitate the administration of the anaesthetic. Mr Dee's recollection of exactly what occurred was not detailed. He agreed with counsel assisting that he went with the baby after the child was born while the obstetrician continued to conclude the procedure with Fiona.

[1] Line 30-45, Page 45

He recalls it was the following day that his wife complained of headache, mainly when she was sitting up. He recalled that she had to lie down again to relieve the pain.

Mr Dee was referred to the document he compiled within a couple of months of Fiona's death.[2] He recalled that on the 8 March both Dr Jackson and Dr O'Brien visited his wife. The visits were separate. Both Fiona and her husband told the doctors that she was suffering headaches when she sat up and that this was not normal for her. Mr Dee recalled Dr Jackson saying that these headaches were not normal but he would give it twenty four hours to see if they went away. Minor pain relief and rest were suggested. Mr Dee could recall a reference to a *"blood patch"* being the treatment to be considered if the headaches persisted. This was explained as stopping or blocking the hole or leak that can occur with a needle inserted into the spine. Mr Dee recalled this was raised by Dr Jackson.

Later, on the afternoon of 8 March 2005, Fiona suffered what appeared to be a seizure and became unconscious. She was taken to intensive care and questions were asked to check whether there had been any previous traumatic injury. There was no history of such an injury or any previous incidence of seizures. A CT scan revealed a subdural haematoma on 9 March 2005. The doctors in intensive care called on the expertise of the neurologist Dr Michael Coroneos to check the CT scan. Dr Coroneos advised that no operation was necessary.

Mr Dee remained with his wife for most of the time while she was in hospital. On 10 March he recalled that his wife told him she still could not sit up without a severe headache. Mr Dee felt that there was some conflict in the advice that was provided at this time. He recalled a Dr Cavanagh, from intensive care and some nurses saying that Fiona should be getting up and moving around whereas Dr Coroneos was saying that she should rest, drink water and not get up.

Mr Dee recalled that he and his wife spoke with Dr Coroneos on 13 March. Fiona was still suffering from the headaches. He recalled Dr Coroneos advising that the headaches might persist for two or three months, that it was normal and that she should rest. Mr Dee asked again if an operation was necessary. Mr Dee's recollection of Dr Coroneos' response was to the effect that he said *"no, this would only make him more money and cause Fiona to lose her hair"*. I have no hesitation in accepting this statement as accurate given its specific detail and the unlikeliness of such a reply being raised by Mr Dee if it had not happened. I note that Dr Coroneos denied making such a statement. As Mr Dee told the inquest, he thought it a rather odd thing to say and it stuck in his head. [3] Mr Dee recalled that Dr Coroneos' opinion was that the bleed was not large enough to warrant an operation. Mr Dee remained worried for his wife's condition prompting him to ask Dr Coroneos again whether she needed an operation.

Dr Coroneos visited again on 14 March. Mr Dee stated that Fiona still could not get up and was still suffering the headaches. Mr Dee stated that he was required to help his wife to get to the bathroom and to shower. Again, the advice remained for Fiona to

[2] Exhibit A24
[3] Line 8-9, page 31

rest and to drink plenty of water. Mr Dee asked Dr Coroneos whether blood thinning medication might assist his wife. Dr Coroneos dismissed the necessity.

On 16 March Mr Dee recalled seeing Dr Coroneos again. He was concerned for his wife and worried about her leaving hospital. Dr Coroneos reassured him that she should simply get sufficient rest and drink plenty of water. Again it was stated that the headaches could persist for two or three months. Mr Dee was concerned that his wife still suffered the headaches each time she got up. Dr Coroneos gave some written instructions on the back of an envelope.[4] Mr Dee asked Dr Coroneos to go through them as he could not read the writing easily. The instructions detailed taking Tegretol for ten weeks before weaning from that medication. Fiona was then to have a scan at three months and see Dr Coroneos after three and a half months.[5] The instructions also referred to not swimming, driving or bathing the baby alone for this period until reviewed by Dr Coroneos.

Mr Dee did not recall any doctors visiting his wife in the last two days that she was at the hospital. There was however an entry in the medical record indicating that Dr O'Brien visited Mrs Dee on the day of discharge.[6] Mr Dee said that as far as he was aware that was the last time Dr Coroneos saw his wife. Mr Dee had no recollection of being told to contact Dr Coroneos a week after her discharge.[7]

Fiona Dee was discharged home on 18 March 2005.[8] A nursing discharge document was given to Mrs Dee. This stated that she should rest for two weeks. An MRI scan was noted for three months and Dr O'Brien and Dr Wood, the paediatrician, at six weeks with a visit to the general practitioner at four weeks. The visit to the neurosurgeon, Dr Coroneos was noted at three months. There was also advice to *"contact your doctor if headaches increase."*[9] There was no reference in this nursing discharge document to contacting Dr Coroneos after one week.

Mr Dee recalls that after her discharge home, Fiona spent most of the time resting and breastfeeding Luke in bed. This was between 19 and 23 March. Mr Dee said that she continued to have strong headaches,[10] stronger than normal headaches.

Mr Dee described the period between the 19 and 23 March as *"It got continually bad…..She had headaches from when we left hospital but then it seemed to get continually a bit worse."*[11]

During this period Mr Dee did not ring the hospital. There seemed to be confusion over whether the hospital or doctor was going to contact them. Mr Dee presented as a quiet and somewhat unassertive person. It was not until Thursday 24 March that he felt she was getting worse and he made a call. During this period his wife was taking Panadol and Panadeine for pain relief.

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[4] Exhibit A 26
[5] Page 33 , Exhibit A26
[6] lines 10-15, page 51
[7] Line 25 , page 35
[8] Exhibit A 28
[9] line 35, page 38, Exhibit A28
[10] Line 10-15, page 21
[11] Lines 34-35, page 21

On 24 March Mr Dee tried to contact Dr Coroneos at his office number which he had been given. The answering machine at his office gave information about the home number and Mr Dee rang this number. Dr Coroneos' wife then provided a mobile number and Mr Dee spoke with Dr Coroneos. He told Dr Coroneos that he was concerned over Fiona's continuing headaches and wanted to check with him that she was alright. He said that Dr Coroneos responded that he should not worry and that her headaches were normal for her condition and to continue to use Panadol and Panadeine for pain relief. He repeated that she needed plenty of rest, to drink plenty of water and take the Tegretol medication. Mr Dee raised the treatment plan which he said he needed to confirm and also the follow up appointments.

Dr Coroneos confirmed to take Tegretol for ten weeks and then a period of weaning from the medication. Mr Dee confirmed that Dr Coroneos had advised them prior to discharge that Fiona should not swim, drive or bath the baby alone for the first three and a half months.

There was no suggestion in the telephone conversation of 24 March that Fiona should come in to be reviewed or referred elsewhere.

Two days later, on Easter Saturday 26 March Mr Dee called Dr Coroneos again. He was worried because his wife had a Panadeine tablet on the Friday night and another on the Saturday morning due to the headaches. She had vomited after each tablet which had not happened before. Mr Dee's phone records indicate the call to Dr Coroneos was at 10.26am. He had been unable to get through on the mobile number the previous evening.[12] He told Dr Coroneos that his wife had vomited after taking the Panadeine and there had been no improvement in her condition.

Mr Dee was told that as long as she wasn't continually vomiting or incoherent that she should continue with the current treatment of rest and pain relief. Dr Coroneos said to use the Panadol and not Panadeine. Mr Dee asked Dr Coroneos about Nurofen as pain relief and was told this should be alright. The length of the phone call is recorded in Mr Dee's phone record as three minutes and twenty one seconds. Mr Dee relied on Dr Coroneos' advice and did not take his wife to the hospital or elsewhere.

Later that same day, at 9.59 in the evening Mr Dee rang the Sunnybank Hospital and spoke with someone from the intensive care ward. Mr Dee was concerned because the headaches were getting worse. Mr Dee was told to follow his doctor's advice. Mr Dee had asked his wife whether he should get the ambulance but she had declined as she was afraid of moving and said she would follow Dr Coroneos' instructions.

The next day, on 27 March Mrs Dee was complaining of her headaches worsening. Mr Dee asked if she wanted to go to hospital but she declined. Mr Dee told the court that the headaches appeared to be more intense, even when his wife was lying down.[13] Mrs Dee then appeared to have a seizure and Mr Dee's sister called the ambulance. Mr Dee rang Dr Coroneos on his mobile. Dr Coroneos told Mr Dee he would see his wife at the Sunnybank Hospital. Mr Dee told him his wife was being taken to the Wesley Hospital, the closest hospital. Dr Coroneos told Mr Dee that the

[12] Lines 2-3 , page 40
[13] lines 20-30, page 44

Wesley Hospital emergency doctors would need to contact him as he did not work at that hospital.

Mr Dee was unaware of any possible side effects of Tegretol or its potential to lower sodium levels. His evidence was that throughout her hospital stay he would help feed his wife in a semi reclined position because of her continuing headaches if she sat upright. On some occasions she used a wheelchair to get to the toilet and to be transported for scans. He would physically help her at other times to walk to the toilet. Mr Dee gave the impression that his wife was a fit and healthy young woman who wanted to be well again and care for her child. She did not appear to complain about her pain and her husband gave the impression she tried to present a positive outlook in order to be able to leave hospital and be with her family.

Mr Tait read out to Mr Dee what he told the ambulance officers which included the following *"Stated by husband of the patient that she had been having headaches for the past three weeks which have become worse. …Patient today had increasing headaches and then the patient collapsed and fitting stated by family member."*

Mr Tait confirmed the initial call to Dr Coroneos and that Dr Coroneos had said to ring him on his mobile if Mr Dee was worried at any time.[14]

Mr Dee explained that he thought at discharge he should call Dr Coroneos if his wife had a problem, although it had not been made clear to him which doctor to call.

Mr Tait sought to emphasize that Mr Dee's chronology did not speak of worsening headaches but rather continuing headaches. That may be so but as Mr Dee said in response,
"That's why I called on the Thursday because I was concerned and I thought she was getting worse."[15]

Mr Dee was clearly worried and concerned his wife's condition was worsening which prompted him to contact the specialist. He was reassured about his wife's condition and told he could reach Dr Coroneos if he needed to do so.

I reject any suggestion that Mr Dee in any way failed his wife by not contacting his general practitioner. He interpreted the discharge notes as referring to Dr Coroneos as the person to contact if necessary. He was entitled to assume that it was Dr Coroneos who was the most appropriate person to request for assistance concerning the issue of his wife's headaches. When he rang Dr Coroneos, the doctor confirmed this was appropriate and that he should ring back if he was worried.

He did become worried and he rang Dr Coroneos but Dr Coroneos repeated his earlier advice without further review of Mrs Dee's condition. Mr Dee said he was somewhat intimidated by Dr Coroneos, quite an understandable response given the respective roles and personalities of Mr Dee and Dr Coroneos and the fact that Mr Dee was reliant on his expertise.

[14] line 19-20 page 94
[15] lines 31-33, page 95

Under cross examination by Mr Tait, Mr Dee agreed that when he spoke to Dr Coroneos' wife he had told her it was urgent and he had been given the mobile phone number. Mr Tait's line of questioning sought to establish that Mr Dee's communication with Dr Coroneos referred to continuing headaches, not increasing headaches. However, the information noted by the ambulance officers referred to headaches for the past three weeks which had become worse.

Although Mr Tait sought to emphasize that Mr Dee's written notes did not list increasing or worsening headaches, Mr Dee responded by saying, *"Well, that's why I called on the Thursday because I was concerned and I thought she was getting worse*."[16]

A summary of how the communication between Mr Dee and Dr Coroneos was ineffective is to be found in the transcript. Mr Tait asked Mr Dee, *"But when you didn't get a response from him for whatever reason, you didn't persist with that?"* (referring to Mr Dee contacting his brother to seek out other medical advice)

Mr Dee responded, *"Well, I trusted, fully trusted Dr Coroneos 'cause he was the neurosurgeon and he was the one looking after Fiona and whatever he said, we did."*

Mr Tait continued, *"But why did you then ask your brother to check with his friend?"*

The response, *"Well I suppose it was a gut feeling that I didn't feel like she was really good…..Something was wrong. I didn't want to, I suppose, I was a bit intimidated by Dr Coroneos when he called, the way he was talking as if, "Why are you talking?" You know, "There's no problem.""*"[17]

Autopsy

An autopsy was conducted on Fiona Dee's body by **Dr Ong, Forensic Pathologist**. A subdural haematoma was confirmed. There were two scans the pathologist had access to, the first taken at the Sunnybank Hospital after the initial collapse and the second at the Wesley Hospital after the final collapse. From comparison of these two scans, Dr Ong expressed the view that the subdural haematoma was stable and had not become significantly larger. He also expressed the view that the underlying cause of the subdural haematoma was probably secondary to the spinal anaesthesia. He drew that conclusion mainly from the reading of the hospital notes. It is a known but rare complication of spinal anaesthesia. The haematoma was diagnosed in the period immediately after the anaesthesia with no other explanation for its occurrence. There was no evidence of any traumatic injury that could otherwise account for the haematoma. There were no other plausible explanations that could explain the haematoma in a fit young woman who had no history of bleeding disorders.

Dr Ong stated that the cause of death was due to hypoxic brain injury as a result of hyponatremia which is low sodium levels in the blood.
Mrs Dee had been taking Tegretol for about two and a half weeks prior to her death. Dr Ong agreed that from his reading of the literature he had discovered that the drug can have the side effect of lowering the sodium level in the blood.

[16] page 95, line 31-33
[17] page 100, lines 1-5

He did not recall expressing a view to her family that Mrs Dee's death could have been avoided. The reason he thought this was unlikely was that he felt it was beyond his expertise to make such a comment. He did however think it quite likely that he would have expressed a view that Mrs Dee's sodium level could have been corrected in the week prior to her death.

Dr Ong stated that the reason for the hypoxic brain injury was the raised intracranial pressure which caused a shift of the brain structures. The association with the spinal anaesthesia was explained as leakage of spinal fluid through the puncture point. Dr Ong thought that an inspection of the puncture site might show signs of leakage although he did acknowledge that it was some time since he had practiced in the area of anaesthesia. That opinion was subsequently contradicted by anaesthetic and neurosurgical experts and I prefer their views on this issue.

When pressed Dr Ong thought that the intracranial haematoma had increased to some extent between the first and second scans but he also expressed the view that the haematoma was in the process of healing.

The second explanation for the increased pressure arising from the haematoma was that the reduced sodium levels in the blood had the effect of increased swelling of the brain which increased intracranial pressure. Dr Ong thought that had the sodium levels been checked by blood tests in the week preceding death, it was possible that adjustments could have been made and thus, the increased pressure and resultant death might have been avoided.

Mr Tait, representing Dr Coroneos and other doctors, questioned Dr Ong further.

Dr Ong thought that although the subdural haematoma was not small, it would not have been significant in causing the death except for the other factors. Dr Ong did not seek to express a view as to whether or not an operation was required to respond to the presence of the subdural haematoma. He also deferred to a clinician's view concerning whether or not routine blood tests would be ordered to monitor sodium levels when prescribing Tegretol. Mr Tait had suggested that only in instances of an altered level of consciousness was it necessary to monitor sodium levels.

There was some evidence about the extent to which one could rely on the low level of sodium recorded when tested at admission at the Wesley. It was agreed by the pathologist that the level could have been reduced due to the administration of Mannitol on admission, a drug which has a diuretic effect and thus could have lowered the level of sodium.

Dr Michael O'Brien was the **obstetrician and gynaecologist** who cared for Mrs Dee throughout her pregnancy and during the delivery. Although he agreed that he would have discussed the risks in general of having a caesarean section, he doubted that he would have specifically raised the scenario that unfolded, namely a subdural haematoma arising as a complication of spinal anaesthesia. Indeed, Dr O'Brien conceded that he was unaware of this specific risk or complication of spinal anaesthesia.

Dr O'Brien stated that almost all patients have spinal anaesthesia (a spinal block). It was clarified that an epidural is usually administered during labour for pain relief. It is administered to the outer lining of the spinal column. An epidural can be *"topped up"* because it is a larger gauge needle. A catheter can be put through the needle and an epidural can be kept going for days.

In contrast, spinal anaesthesia is administered through a finer needle and is administered into the spinal column. It works very quickly and effectively. It works for a limited period of time and is not usually topped up.

Dr O'Brien could not remember whether he observed the administration of the spinal anaesthesia in this case. In answer to questions from Mr Tait, he stated that he had confidence in Dr Jackson's ability as an anaesthetist. He had known Dr Jackson for twenty years. He indicated that from time to time every anaesthetist will have difficulty in administering a particular anaesthetic but this was not an indicator of lack of competence. Dr O'Brien had confidence in his competence and had used him repeatedly to administer his anaesthetics.

Dr O'Brien had no problems in delivering the male child by caesarean section. As a normal practice a catheter was in place and would remain in situ until the following day. Dr O'Brien saw Mrs Dee on the morning of 8 March although he did not record any notes. He said his practice was not to make a note unless there was something outside the normal expected progression of events. Later that afternoon he was contacted by phone and advised that Mrs Dee had an epileptic fit. He immediately returned to the hospital and saw her within fifteen minutes. Dr O'Brien's evidence was that he visited Mrs Dee every day from then until her discharge. He was not certain whether he had visited during the intervening weekend. A doctor covering the weekend would have visited. He conceded that there is not necessarily an entry recorded in the notes on each occasion he visited. He gave clear evidence that he saw Mrs Dee on the day of discharge, Friday 18 March. He did not have specific recall but thought he would have consulted other doctors involved in her care regarding the timing of her discharge. He was happy with her being discharged home.

He recalled that she was still having headaches when getting up which made it difficult to go to the bathroom. He understood that she could expect to have headaches for some time due to the subdural haemorrhage (his words). Dr O'Brien's evidence was not very clear concerning the manner or extent of his communication with other treating doctors regarding the patient's condition namely the haematoma.[18]

Dr O'Brien could not remember specifically any discussion about the possibility of a blood patch to address continuing headaches. He said he would not have been consulted about this decision as it would be a matter for the anaesthetist. It was put to Dr O'Brien that in fact Mrs Dee was suffering continuing postural headaches requiring pain relief while in hospital. Dr O'Brien acknowledged this but thought that she was getting better over the ten day period and was well enough to go home.[19]

[18] lines 20-30, page 72
[19] Page 74

Dr O'Brien understood that Mrs Dee was able to get up and walk around although still suffering headaches. He said he was unaware that she still needed assistance to get to the bathroom at the time of discharge. His experience was that many women who suffered epilepsy continued the use of Tegretol throughout pregnancy and breastfeeding, it being of critical importance to control seizures.

Dr Colin Jackson was the anaesthetist who administered the spinal anaesthetic to Mrs Dee to enable the elective caesarean to proceed. He asserted that spinal anaesthesia was the safest way to anaesthetize a patient for delivery because it does not affect the baby.

He explained a spinal anaesthetic is deep down into the dura, the outside membrane of the spinal cord and is injected into the cerebrospinal fluid whereas an epidural anaesthetic is outside the dura. A cerebrospinal fluid leak does not occur with an epidural. The effect of the anaesthetic is to block pain below about breast level without making the patient unconscious.

Dr Jackson had spoken with Mrs Dee prior to the procedure and taken her history. He had previously administered an epidural for her first pregnancy for pain management during labour. The second baby was to be by elective caesarean hence the choice of spinal anaesthesia rather than merely an epidural. He had noted previous thyroiditis.

There was a record of the administration of the anaesthetic. The gauge of the needle was not recorded but Dr Jackson informed the court it was a 27 gauge Whittaker needle. He acknowledged this information should have been recorded. It was his practice to use this size as it was the smallest size needle of the three options available. A local anaesthetic was administered first. He said there was no problem in administering the anaesthetic. He explained the procedure involved placement of a cannula and then the needle. Monitoring of the patient was maintained. He recalled the patient's blood pressure dropped to 85 briefly but did not require treatment.

Dr Jackson said he was unaware of the risk of a subdural haematoma when using a needle as fine as the gauge 27.

He was called in the following night when Mrs Dee started to fit. Prior to that fit Dr Jackson had seen Mrs Dee. She had told him she had a right sided headache. He did not think this was a postural puncture headache. Later that evening he was called back when she commenced fitting and was transferred to intensive care under the care of Dr Cleary and Dr Coroneos. Dr Jackson continued to visit but said this was by way of courtesy as her care was now with Dr Cleary and Dr Coroneos. He was not aware that he had been notified that she was getting postural headaches but then, he said he was aware her headaches were decreasing from talking with other doctors.

He did recall consideration of an epidural patch being given. He said the concessus view was that this is not undertaken in the first twenty four hours. The picture was confused by the fact she had then been diagnosed with a subdural haematoma. Dr Jackson's opinion was he would not do an epidural patch where a person had a subdural haematoma. His reasoning being that the cause of the headache was probably the subdural haematoma rather than being related to the spinal anaesthesia.

He based this conclusion on his assumption that subdural haematomas cause severe headaches.

This is curious given that Dr Coroneos and Dr O'Brien emphasized the headaches were not very severe.

Dr Jackson did not subsequently discuss the issue with Dr Coroneos. His opinion was that with a fine gauge needle such as the 27 gauge he would not expect the puncture to remain open for more than a couple of days.

Dr Jackson seems not to have involved himself in Mrs Dee's care after her transfer to intensive care. When asked in court, he expressed the view that the literature suggests post dural headaches can last for years or may go away with a post dural patch however with the presence of a subdural haematoma, the headache could persist.

Dr Jackson found some difficulty in giving his evidence. He did not acknowledge that the continuing headaches were postural post dural headaches despite the weight of other evidence that the continuing headaches had all the classical signs of CSF leak.

It is perhaps understandable that Dr Jackson might be led to that conclusion because of the diagnosis of the haematoma which might otherwise explain the headaches and also due to the fact that he seems not to have been further involved in treatment decisions. The evidence unfolded that after discharge from intensive care, the issue of continuing headaches seems to have rested solely with Dr Coroneos. The obstetrician considered the patient to be progressing well from his point of view and was dropping in socially without recording notes. Likewise, the anaesthetist was visiting Mrs Dee merely as a courtesy with no involvement in discussion or treatment. A perusal of her notes must surely have alerted him to the likelihood that the description of the headaches fitted consistently with a diagnosis of postural post dural headaches.

Without suggesting there was any apparent error in the administration of the anaesthetic (statistically there are a certain percentage of known side effects) the fact remains that the genesis of Mrs Dee's problems arose from the administration of the spinal anaesthetic. Mrs Dee suffered a seizure and then a most unusual subdural haematoma as well as postural headaches. All these events were recorded after the anaesthetic. It seems at least, a missed opportunity for collegiate discussion involving the anaesthetist and the neurosurgeon. Dr Coroneos' evidence was clearly that he considered Mrs Dee was suffering both from subdural haematoma and post dural headache whereas Dr Jackson seems to have discounted the possibility of post dural effect once the subdural haematoma was diagnosed without afterwards involving himself in active discussion. It was apparently the realm of the anaesthetist to administer a blood patch had a decision been reached but this seems not to have been discussed by the anaesthetist with the neurosurgeon.

Dr Singh was called to give evidence. He is a cardiologist who saw Mrs Dee on 10 March 2005 due to an episode of tachycardia. An echo cardiogram was normal. There was no evidence of underlying heart disease and cardiac enzymes were normal. Accordingly, Dr Singh speculated that it may be related to the subdural

haematoma and raised intracranial pressure. He acknowledged that other patients who had suffered intracranial bleeds had experienced a different type of arrhythmia.

The episode of 27 March was described to Dr Singh. Mrs Dee had suffered a seizure and was deeply unconscious with a Glasgow coma scale 3 recorded by the ambulance officers. On arrival at the Wesley Hospital she suffered an episode of ventricular tachycardia. Dr Singh said this could be consistent with the intracranial event and such instances had been noted.

Dr Singh's evidence pointed to the subdural haematoma being the cause of events leading to Mrs Dee's death not a cardiac cause.

Dr Michael Cleary gave evidence. He was the intensive care specialist working at the Sunnybank Hospital who was involved in Mrs Dee's care after the initial collapse and seizure in hospital. Dr Cleary saw Mrs Dee for the first time around 6.00pm on 8 March. There was a discussion regarding the use of steroids. Dr Cleary stated the decision was within the specialty area of Dr Coroneos who has given evidence that steroids were not appropriate in this type of brain injury.

He confirmed his observations indicated that Mrs Dee was suffering postural headaches indicating a possible CSF leak. He could not recall whether this was discussed with Dr Coroneos. The entry on 10 March recorded that Mrs Dee had a good day but still recorded a postural headache. This continued the next day. She returned to the maternity ward on 11 March. On that day there are notes indicating she was having difficulty getting up to shower or go to the toilet.

Dr Cleary could not recall any discussion between Dr Coroneos and himself about the possibility of an epidural blood patch. Dr Cleary did not consider this. He believed that the postural headache could be managed with fluids, analgesia and keeping the patient lying flat. He considered a blood patch to be a fairly significant procedure so the conservative approach should be trialled first.

Dr Cleary's evidence finally was that he could not recall whether he would have even discussed the possibility of an epidural blood patch.[20] He agreed that the longer the postural headaches persisted, the more one might consider the blood patch.

While in intensive care, Dr Cleary ordered a blood test to determine the level of Tegretol. He said this was to check that it was within therapeutic range.

Dr Cleary added some information about Mannitol which was administered upon admission to the Wesley Hospital. He explained it is given into the blood stream and has the effect of attracting water from other parts of the body into the blood circulation. The effect was to reduce the swelling but a side effect could also be to dilute electrolytes in the circulation. There may have been some impact on lowering sodium levels by the administration of Mannitol but he really did not purport to express a view on this issue.

[20] page 301 line 8

Dr Coroneos gave evidence. He was called to see Mrs Dee on the evening of 8 March by Dr Pointing in the intensive care unit at Sunnybank Hospital. Mrs Dee had recently given birth and then had a seizure. On examination there was confirmation of cerebral irritation. An urgent CT scan was performed which revealed a subdural haematoma. Initial medication of Dilantin was ordered to prevent further seizures. Other tests were performed for protein levels and coagulation studies. Her blood pressure was checked and monitored. An MRI cerebro angiogram was performed. Initially Dr Coroneos suspected a ruptured aneurysm as the cause of the haematoma. On questioning, he acknowledged that a subdural haematoma can be a rare complication of spinal anaesthesia. He did not rate this as a high probability due to its rarity.

The MRI showed a small area of subdural blood but no aneurysm. There was mild swelling on one side of the brain.

When Mrs Dee developed a reaction to the Dilantin he substituted Tegretol. Dr Coroneos said he had never heard of a case of hyponatremia as a side effect of Tegretol but on further clarification acknowledged he was aware it was a rare event.

He agreed the patient was experiencing continuing headaches particularly of a postural nature on sitting up. He considered the most likely cause was so called low pressure headaches as a result of spinal anaesthesia. He thought it more consistent with the effects of spinal anaesthesia than the effect of the subdural haematoma. He said there were discussions with the anaesthetist and conservative monitoring was thought to be appropriate.
He did not consider a blood patch but could not comment regarding the anaesthetist's view. They did not discuss the need for a blood patch, thinking that Mrs Dee was making progress.

His examination noted in detail Mrs Dee's condition as consistent with being in a post seizure state. She had an enlarged right pupil.

Dr Coroneos' notes recorded a variable condition of the patient regarding headaches from day to day. Mrs Dee was recorded as being lethargic and not very well but on another day, *"Looks and feels very well".* The notes also record the planned treatment follow up which was discussed with Mrs Dee and her husband. Tegretol was to continue for 10 weeks before a period of weaning. A follow up EEG and an appointment with the neurologist, Dr Reid were recommended. A repeat MRI and MR angiogram in three months time were discussed. These notes were summarised on the back of an envelope containing the referral to Dr Reid which was handed to the patient on 15 March. She was discharged on 18 March.

Dr Coroneos thought that surgery was not required to treat the haematoma given its relatively small size. He did not think it necessary for a follow up CT scan given his observations and the plan set in motion for future review.

He acknowledged there were recorded notes about Mrs Dee for 11 March indicating she could not walk independently due to headache and needed assistance to shower. His entry of 14 March noted her to be lethargic.

Dr Coroneos disputed there being any clinical need for follow up CT scan given what he described as intermittent headaches, continuing improvement, the observations in hospital over time, the Glasgow coma scale score of 15 and the absence of other signs to cause alarm.

When recounting the nature of the calls with Mr Dee, Dr Coroneos referred to Mr Dee seeking explanation of the treatment plan. He was asked whether Mr Dee raised the issue of headaches. Dr Coroneos said he referred to Mrs Dee having occasional postural headaches. Dr Coroneos was happy with Mrs Dee's progress. There was no reason for any concern indicated to him by that telephone call. He denied Mr Dee expressed concern about continuing headaches. He simply said he recalled that she was still experiencing occasional headaches of a postural nature. He admitted that was probably not the language used by Mr Dee. He said he didn't believe that Mr Dee would have said that (referring to "continuing headaches"). This seems a curious response to the question that had been asked.

He agreed that he told Mr Dee that he could ring him if he was worried. Dr Coroneos stated the second call from Mr Dee was to inform him about the patient's progress as he had asked him to do so the previous week when she was in hospital. I remark that seems illogical given that he says this about the second phone call which occurred only two days after the first.

Questions were put to Dr Coroneos about the content of the second call and whether Mr Dee had told him that she vomited after taking a Panadeine tablet. Dr Coroneos immediately responded by stating that Mr Dee had been ringing and asking about whether Nurofen was better than Panadeine. He did not initially answer the question but when pressed by Mr Chowdhury he conceded that Mr Dee may have spoken about her vomiting after taking Panadeine.

Again, when Mr Chowdhury asked whether this information had caused Dr Coroneos any concern, his response was curious. He said, *"I spoke to Mr Dee about her condition and he was happy with her progress and there was no other concern. The headaches were intermittent and postural and she was improving."*

Mr Chowdhury checked, *"Are you saying that Mr Dee was happy with his wife's condition?"*
Dr Coroneos replied, *"Well that was the outcome of our discussion. It was a mobile telephone call."*

Dr Coroneos denied that Mr Dee had told him he was worried there had been no improvement in Fiona's condition.

Dr Coroneos' recollection of that second call was, *"I asked about the headaches and he indicated to me that they hadn't worsened. They were still intermittent and I said, "Is everything going ok?", and he said, "Yes, everything's fine. We just wanted to ask about the Nurofen." And I said, "Well that's fine Scott. Just make sure that it's okay to be used in breastfeeding", and I recall he told me he'd already done that, or he was about to do that, and I said, "Well, that's good Scott. You ring me if there are any problems. You feel free to call me.""*

No notes were made of these calls by Dr Coroneos.

Mr Chowdhury suggested to Dr Coroneos that in fact Mr Dee had rung on the first occasion and expressed concern about Fiona's continuing headaches and two days later on 26 March; he rang and said that Fiona had vomited after a Panadeine tablet. Mr Dee said there had been no improvement and he was worried.

He was asked what would have been his response if this was the scenario.

Dr Coroneos said it would not have changed his treatment because the headaches would have been expected to continue. The vomiting after Panadeine is more consistent with irritation to the stomach rather than anything more serious such as raised intracranial pressure. So his management would have been unchanged.

Even given this scenario, Dr Coroneos disagreed that the prudent course would be to advise the patient to go to the hospital for review.

He stated he had not consulted with any other neurosurgeon even though the case was very unusual.

Dr Coroneos was quizzed about his answers to the Health Rights Commission. There he postulated that Mrs Dee's thyroid disease and cardiac condition may have contributed to her death.

Dr Coroneos persisted with the reference to cardiac contribution on the basis that she was to be reviewed by the cardiologist in three months time. He conceded there was no evidence of cardiac problem at autopsy although arrhythmia cannot be *"seen"* at autopsy. He denied having been told by Dr Singh that the cardiac arrhythmia was likely to be a consequence of the subdural haematoma.

Counsel for the family asked further questions. He took Dr Coroneos through the medical notes detailing Mrs Dee's condition throughout her admission. Dr Coroneos acknowledged that the development of a subdural haematoma as a response to a spinal anaesthetic was very unusual. Hyponatremia was also considered to be a rare complication as a side effect of Tegretol.

He acknowledged that postural headaches could occur as a response to spinal anaesthesia. Mrs Dee continued to have postural headaches up until Saturday 26 March. When quizzed about the probable cause of these continuing headaches, Dr Coroneos was of the view that they were continuing due to continuing leakage of spinal fluid after the spinal anaesthesia. He stated that 95% of these headaches take about six weeks to resolve.

He was asked when he would expect a subdural headache to resolve. He replied that the pattern with these headaches was constant increasing headache with vomiting, loss of consciousness and neurological signs.
He agreed he had told the Dees these might take three months to resolve. He said they usually gradually settle.

Dr Coroneos' assessment of Mrs Dee during hospitalisation led to his note, *"All really is looking like an acute right subdural haematoma and seizures secondary to a decrease in intracranial pressure after the lumbar puncture leading to CSF extravasating (leakage of CFS into soft tissue)."*[21]

Dr Coroneos documented what he thought had occurred in Mrs Dee's case as, *"On sitting patient experienced headache and herniation with secondary subdural haematoma."* He noted this was most unusual in the absence of a space occupying lesion. He noted she was continuing to have postural headaches. There were also notes indicating Dr Coroneos' advice to rest in bed and keep hydrated.

On Saturday 12 March Dr Coroneos recorded that Mrs Dee looked really well and did not report a postural headache although she had taken Panadol. It was noted there was still a small risk of further seizures on Tegretol and that she should ambulate and sit up slowly. Dr Coroneos indicated at this stage there had not been any vomiting or neurological signs and the headaches were *"all but settled".* He felt she had improved.

The entry on the 14 March refers to Mrs Dee being lethargic as well as having a postural headache. Otherwise observations were good. It was recorded that the aim was to go home on Friday from the neurosurgical point of view.

On Tuesday 15 March Dr Coroneos saw her and said she was well with minimal headache. He observed her back and could not discern any CFS leak which he said could be detected if there had been a large leak. A discussion was held with the patient and family members still planning for discharge on Friday.

The plan of action, medication, referrals and review was again noted and handed to the patient.

Although the last entry in the chart is dated Tuesday 15 March, Dr Coroneos gave evidence that he saw her every day until discharge on Friday 18 March. He explained that the chart may not have been available in her room when he saw her or that he forgot to write notes. Dr Coroneos was adamant he did see her after 15 March and before discharge on 18 March. He said he saw her in the usual way indicating he would see her at the planned review point and that the hospital had its own administrative discharge processes.

Dr Coroneos stated he advised that an operation was not needed due to the small size of the subdural haematoma. On 15 March his recollection was that Mr Dee and Mrs Dee's parents were also present and were all thankful that she was well enough to go home. Dr Corones said by the time Fiona left hospital she was independently caring for her child and was wandering around. He said the nursing staff was also happy with her progress. He said her headaches were basically resolved. He said if the headaches were still postural after her discharge, they would not be of concern. There would be no change in her condition and they would continue for a number of weeks.

[21] page 225 line 30-40

Dr Coroneos was also keen to emphasize the size of the subdural haematoma was *"small".* It was recorded as resolving when seen at autopsy, meaning that it was in the process of healing and the whole mass, including membranes was five millimetres.

Dr Coroneos' recollection of the first call that Scott Dee made to him on the Thursday after discharge is summarised as follows.

There was a query about the referral to the cardiologist Dr Singh and a query about weaning off the Tegretol. Dr Coroneos went over the plan. Mr Dee was basically checking on instructions for the next three months.

During this conversation Dr Coroneos says that Scott said Fiona was doing satisfactorily. Dr Coroneos said he understood that she was still having intermittent headaches but no constant headaches, vomiting or drowsiness and she was quite coherent. Dr Coroneos said, *"Well that's good Scott"* and that was that.[22]

Dr Coroneos said he asked how things were going and Scott said, *"we're doing okay"*. This did not suggest there was any detailed conversation about Fiona's condition. Dr Coroneos said that Scott indicated he was happy with her progress and that she still had some mild headaches. Dr Coroneos denied any report of continuing headaches. He said they were postural. They were not increasing. He said he believed she was doing well.

Dr Coroneos categorised the Easter Saturday phone call as Mr Dee reporting in about Fiona's condition as advised by Dr Coroneos a week after discharge. It would seem a curious way to approach such a phone call given that Mr Dee had already phoned on the Thursday.

On the nursing discharge sheet there was a note, *"contact Doctor if headaches increase".*

In relation to the second phone call Dr Coroneos says Scott told him Fiona had vomited after taking Panadeine. He said there was a request for the use of Nurofen instead and he agreed subject to it being safe when breastfeeding. He assumed the vomiting was a stomach upset in reaction to the Panadeine. He denied that Scott expressed any concern and said it was just mentioned by Scott that his wife had vomited.

Dr Coroneos explained that one episode of vomiting without constant headaches, drowsiness or other neurological signs was not a sign for concern.

The passage of evidence between Mr McGuire and Dr Coroneos on page 256 was crucial. Dr Coroneos was not convincing in his denial that Scott was concerned about his wife now vomiting after the series of health concerns she had developed since entering hospital as a fit young woman in preparation to give birth to her second child. The most significant impact this passage of evidence provided was that Dr Coroneos simply did not recognise the importance of what was being said by Scott Dee. It does not matter whether it was Scott or Dr Coroneos who first raised the issue of Nurofen.

[22] page 250 line 40

After hearing Dr Coroneos' evidence and also the evidence from Scott, I am quite satisfied that Scott did telephone Dr Coroneos to tell him he was worried about Fiona's condition particularly her headaches and that she had now vomited after taking Panadeine on the Friday night and the Saturday morning.

My impression after assessing Dr Coroneos' evidence is that he simply did not understand the communication from Scott. He did not perceive the importance of the communication from Scott. I do not think Scott failed to explain himself. I think Dr Coroneos did not listen and did not hear what was being said. Repeatedly in the witness box his response to a question did not answer the question but sought to tell the court what it was he wanted to say. He responded very quickly, often before a question was complete.

I am not satisfied that he did make full and proper inquiry into Fiona's condition. He did not speak with her; he did not request to do so. He did not make detailed inquiry of her husband as to her exact condition. The phone call was recorded as being quite brief.

For whatever reason, I think that Dr Coroneos missed the message from Scott. I have remarked that Scott presents quietly and somewhat unassertively and Dr Coroneos could well be described in opposite terms. The fact that this was the second call within days from the patient's husband should have raised questions in Dr Coroneos' mind. The patient was in a very unusual state of health. Her history involved several unusual factors. She had suddenly had a seizure with no history of trauma or other relevant episode. She had been diagnosed with a subdural haematoma which was a very rare complication of spinal anaesthesia. The presentation of the subdural haematoma in itself was unusual being unilateral. As well, she continued to suffer from postural headaches due to cerebrospinal fluid leakage from the anaesthetic puncture site. She remained at risk of further seizure or development of the haematoma.

Dr Kahler was a neurosurgeon who worked at the Wesley Hospital and saw Mrs Dee on her admission to that hospital after her final collapse on 27 March. She was deeply unconscious with large fixed dilated pupils. A CT scan showed a right parietal subdural haematoma between one and one and a half centimetres depth with midline shift.

Dr Kahler noted also the incident of tachycardia that occurred at the Wesley and expressed the view this could be related to the serious brain injury or the hyponatremia.

After Mrs Dee's death, Dr Kahler spoke with the family and expressed the view that the subdural haematoma was a result of the spinal anaesthesia, being a known but very rare complication of that procedure. He also considered there was a slight increase in the bleeding level from the first CT scan. In Dr Kahler's opinion the very low sodium level had also resulted in increased intracranial pressure which had contributed to her death. He agreed that Tegretol can have the uncommon side effect of lowering sodium levels but also the brain injury itself could lead to low sodium levels.

Dr Kahler added weight to the view that given the history, it would be wise to order a CT scan about two weeks post discharge rather than an MRI at three months. This was in line with his normal practice.

When asked specifically by the family whether Mrs Dee could have been saved if she had accessed treatment earlier, Dr Kahler explained that his view was that the hyponatremia and the subdural haematoma were both treatable conditions in themselves. Earlier identification and consideration of appropriate treatment could only have improved the chance of survival. If the problem of the low sodium had been diagnosed and treated the day before, the Saturday, Dr Kahler considered her death could have been prevented.

It is important it be noted that only a blood test could have detected the low sodium level. Had she presented to a hospital with her history there would, as a matter of course, be blood tests ordered as well as a CT scan.

Dr Kahler was asked to comment on the report that Mrs Dee had vomited after going home which was reported to the neurosurgeon by her husband. He said he would be a bit concerned that she was vomiting. It could be simply a stomach reaction to an analgesic or it could be more serious.

Dr Kahler was taken to task by Mr Tait for passing comment without access to all information but Dr Kahler emphasized that he had responded to the family's questions in a general way.

What was established as the overall clinical picture in the context of the history has to be considered. The level of concern of the relative contacting the neurosurgeon would also be a factor. However, on further clarification from Mr Chowdhury, Dr Kahler stated the normal response after repeated calls expressing concern, is to at least have the patient seen. He expressed it as *"If I can't see them myself, get them to someone who can……where a doctor can assess her."*[23]

Dr Kahler affirmed that he considered the anaesthetist continued with some responsibility to consider whether the epidural patch should be given. This decision would be made together with the intensivist if the patient was still in intensive care. The anaesthetist performs the procedure but the doctor with ongoing care has ultimate responsibility. While in intensive care the intensivist may involve other specialists for particular areas. Dr Coroneos was called in once the subdural haematoma was identified. A *"co-ordinated team approach"*[24] was what Dr Kahler expected would be adopted in such a complex medical series of events.

With the benefit of reviewing the history and hearing evidence from the various doctors involved, it is apparent that responsibility for Mrs Dee after she left intensive care seems to have devolved to Dr Coroneos. However, the situation called for ongoing communication between the different specialties, in particular, discussions between the anaesthetist and the neurosurgeon about the complex medical conditions that had arisen since her anaesthetic.

[23] page 293 line 30-35
[24] page 295 , lines 24-45

There was evidence that Dr Coroneos remains somewhat isolated from his professional peers. The importance of the ability to interact collegially with professional peers has been raised again when reviewing the management of Mrs Dee.

Dr Adrian Nowitzke, Director of Neurosurgery at the Princess Alexandra Hospital gave evidence. He had reviewed the medical records of the Sunnybank and Wesley Hospitals and had also considered the expert report of Dr Genevieve Goulding. He had read the statements of Doctors O'Brien, Jackson and Coroneos as well as the autopsy report.

He accepted that Mrs Dee had suffered a seizure on 8 March although there was scant description in the record. He also confirmed that a CT scan identified a subdural haematoma, a blood clot in the space deep or below the dura, on 8 March. It was a unilateral haematoma which was remarked upon as being unexpected. It could be distinguished on the scan from the typical kind of subdural haematoma caused by trauma. He stated that post spinal punctures have, in rare instances, led to subdural haematomas. Most of these examples identified in the literature were bilateral, however, in all the circumstances, he concurred that Mrs Dee's haematoma arose as one of the rare instances reported after a spinal puncture procedure.

He did not expect that this phenomenon would be widely known amongst anaesthetists, due to its rarity.

Dr Nowitzke also commented on the instance of Mrs Dee experiencing tachyarrhythmia. This had occurred while Mrs Dee was in intensive care after suffering the first seizure and again, after admission to the Wesley Hospital. He concurred that this would not precipitate or be connected to the seizure event.

He considered whether Mrs Dee's ultimate death might be due to seizure or to a cardiac event. He stated that it is rare to die from a seizure but this must be set in the context that Mrs Dee was also subject to hyponatremia which would have an additive effective in the overall impact on Mrs Dee's health. Although he was aware of associated cardiac conditions with subarachnoid haemorrhage, this was not the case with subdural haematoma. The associated two episodes of tachycardia in this case were unexpected from Dr Nowitzke's experience. His opinion was that the subdural haematoma in itself was not large enough to have caused Mrs Dee's death. Although he said he would not classify Mrs Dee's death as being cardiac based, there was a question raised in his mind about the episodes of tachycardia. He referred to the evidence of some ischemia and the signs of brain swelling which do not occur with epilepsy. Swelling occurs because there is no oxygen getting through to the brain either due to cessation of breathing or of the heart pumping. The evidence from the CT scan indicated a large degree of pressure in her brain and that it had come quickly. Dr Nowitzke asserted his view after considering the report of Dr Singh, the cardiologist. There was no evidence from either the cardiologist or the pathologist suggesting a heart problem.
Dr Nowitzke still wondered whether there was any episode of trauma but there was no evidence of this.

He confirmed the post mortem diagnosis of hyponatremia. He remarked that the first reading taken at the Wesley Hospital of 119 millimols per litre was extremely low and that the increase to 138 in just over two hours was remarkable.

Dr Nowitzke disagreed with Dr Ong's conclusion that the cause of death was hypoxic brain injury due to hyponatremia. He said this is not a causative relationship. The hyponatremia may be a contributing factor to a death that was caused by respiratory arrest or seizure.

Dr Nowitzke also opined that the hyponatremia may or may not be due to the subdural haematoma.

He agreed that Tegretol was appropriately prescribed after the seizure on 8 March and considering the allergic response to the first medication, Dilantin. The area of difference in approach from Dr Coroneos' approach was that Dr Nowitzke and the Princess Alexandra Hospital would have arranged for the patient to be reviewed at the hospital in two weeks with a repeat CT scan rather than expect the patient to ring if there was a problem. The rationale for this approach was that in a young person such as Mrs Dee if the size of the subdural haematoma increased to any extent it could be a significant problem.

Dr Nowitzke confirmed that the initial decision not to intervene operatively was consistent with what he would have done in the circumstances. There was a good chance that the haematoma would spontaneously resolve itself.

Another critical issue was the therapeutic level of Tegretol given the finding at autopsy of hyponatremia. Tegretol levels could vary significantly if not taken regularly but Dr Nowitzke said that it was more a question of setting an initial dose and monitoring whether it was sufficient to control the seizures then adjusting the dose if required. The drugs have side effects so the aim is to achieve the lowest possible effective rate of medication. Dr Nowitzke's information to the inquest was that testing for levels of Tegretol was uncommon, the reason being that it was not a drug like Dilantin that had a narrow band of safe benefit to the patient without going into toxic range. In other words, when prescribing Tegretol the dosage was monitored on clinical outcome of control of seizure rather than measuring the level in the blood.

Dr Nowitzke interpreted the continuing postural headaches on becoming vertical as classical indicators of a post lumbar puncture problem. He said the continuation was not likely to indicate an increasing haematoma because it occurred on standing or sitting erect rather then the reverse. Dr Nowitzke raised consideration of performing a blood patch with the continuing problem of postural headaches.

The notes continue to record postural headaches although there are also some more positive reports of Mrs Dee feeling well at various times. Postural headaches are noted, up to and including 15 March.

Dr Nowitzke's opinion was that the circumstances upon discharge called for a review by the neurosurgeon between two and four weeks. The aim would be to review within two weeks as it would be unlikely that the subdural haematoma would progress to any dangerous extent in that period. Also, the postural headaches could be checked as Dr

Nowitzke noted there seemed to be variation in the severity of how these were reported between the nursing and medical staff. At the very least, he would expect a review by the general practitioner in this time, ideally with a CT scan.

The proposed MRI scan at three weeks was commented upon as being a very thorough proposal. Indeed Dr Nowitzke remarked very favourably about the detailed documentation concerning the follow up plan made by Dr Coroneos. It was noted that the general practitioner should also have received a copy of the discharge plan. Dr Nowitzke was frank in stating that this tended to be done more consistently in private rather than public hospitals.

As to consideration of repair of the hole in the dura causing the postural headaches, Dr Nowitzke observed that it can be treated by injecting a blood patch which congeals into the space outside the dura blocking off the leak.

One of the problems here was that it was difficult to identify which doctor acknowledged thinking about the issue of treating the continuing problem.

The obstetrician Dr O'Brien told the court that he considered it to be the anaesthetist's field but as Dr Nowitzke remarked, the anaesthetist might well be unaware of the continuing problem after the anaesthetic unless brought up by the obstetrician who had primary care of the patient. This seems a valid point.

My recollection of the evidence is that the obstetrician took the view that the headaches were caused by the subdural haematoma and thus the responsibility of the neurosurgeon. As in many other cases reviewed by this court, the issue of communication between different treating specialists to achieve holistic and appropriate care could well be called into question.

Dr Nowitzke also differed in his opinion about how long he would expect subdural related headaches to persist. He thought three months was too long a period and suggested this would mean the haematoma was not resolving as expected. He thought it should cease in a couple of weeks. He did however agree that the lumbar puncture headache could persist for longer. Here, the strong evidence was that the headaches were in fact due to the lumbar puncture because they were postural, that is, worse on standing.

Dr Nowitzke stated the issue of continuing headaches would need to be queried. He suggested questions like *"Are they disabling headaches? Are they getting worse? Have they changed? Are they associated with other things such as vomiting, reduced level of consciousness, confusion, memory changes?"*

The key was in assessing the information to determine whether the headache was what is to be expected given a known subdural haematoma or was it sinister? The information being considered by Dr Coroneos was also being relayed via a lay person, her husband, without Dr Coroneos speaking with or seeing the patient. Dr Nowitzke's comment when told that Mrs Dee was reported to have vomited on the morning of Saturday 26 March after taking Panadeine was that this was an additional matter that

would need to be considered. *"Headache plus vomiting, particularly new vomiting, needs to be taken seriously."*[25]

By the Saturday morning at about 10.30, Mr Dee called Dr Coroneos again saying Fiona had been sick after the tablet. There was no improvement in her condition and he was worried. Dr Nowitzke considered that the situation recorded at that time called for the patient to be brought to the emergency department primarily for a CT scan but also a serum sodium test. Dr Nowitzke emphasised that this was a judgment call and not a simple decision viewed through hindsight. However he affirmed that, *"The appropriate response for someone who rings you back several times to tell you that they are concerned, that should be taken seriously and they should at least have a CT scan of their brain and preferably a full medical review."*[26]

He also explained that the situation observed by the Wesley Hospital in the CT scan of *"coning"* meant that the brain was swelling and being pushed down into the spinal column space *"the person is dying very quickly"*[27]

Dr Nowitzke also confirmed Mr Dee's concern about the use of Nurofen, an anti inflammatory which also has anticoagulation effects. His advice was to stay away from this medication for an intracranial haematoma.

Dr Nowitzke confirmed that Tegretol was an appropriate anti-seizure medication and there could be no criticism that a seizure had occurred on this mediation. The medication cannot guarantee there will be no seizure but does reduce the risk.

Although noted in the reference book MIMS, Dr Nowitzke disagreed that hyponatremia could be described as a *"common"* side effect of taking Tegretol. It was not his practice to routinely order serum sodium tests for people on Tegretol or other antiepileptics. Blood tests would not be routinely ordered by Dr Nowitzke to check the level of the drug. It was always a question of monitoring the drugs effectiveness in halting seizures at the lowest possible dosage rather than maintaining a set level of the drug. He also informed the court that the condition of hyponatremia can be asymptomatic.

Dr Nowitzke considered hyponatremia to be a tricky condition in this context. He would have invited input from endocrinologists. He said that simply ceasing the Tegretol was not necessarily the solution.

On an overview of Mrs Dee's case, Dr Nowitzke emphasized that there were several very rare circumstances that occurred together to lead to the situation causing her death. The subdural haematoma caused some swelling, as well as the condition of hyponatremia. Mrs Dee had seizures as well, despite being on Tegretol. It was all of these rare circumstances together which led to her death in Dr Nowitzke's opinion. A CT scan prior to her final emergency admission to the Wesley might have alerted doctors to take some earlier action but he could not be categorical this would have changed the outcome. As a clinician, Dr

[25] page 135 line 9-10
[26] page 136 lines 10-14
[27] page 136 line 31

Nowitzke had carefully reviewed all of the information and his opinion was that the sequence of very rare events meant that the death was not preventible

Further questions from counsel were put to Dr Nowitzke. He agreed that Dr Coroneos was somewhat isolated from the relatively small group of practising Queensland neurosurgeons.

He remarked on the fact there had been an incident of tachycardia but could neither connect nor disassociate that with the neurological condition of the haematoma. However, he would accept that it was observed at the time of diagnosis of the haematoma.

Dr Nowitzke said the diagnosis of continuing cerebrospinal fluid leakage was a clinical one. It was not possible to simply observe the site of the lumbar puncture to determine whether it was continuing. The continuing postural headaches in hospital were considered by Dr Nowitzke to be due to CSF leak. He thought a blood patch should have been considered given the time and persistence of the postural headaches. If headaches were continuing after three weeks, Dr Nowitzke would have considered the matter needed to be reviewed.

Lowered sodium levels in the brain can raise the pressure in the brain. This was another possible explanation of the headaches experienced by Mrs Dee.

He explained that the administration of Mannitol was a standard response to try to buy time where there was a build up of pressure in the brain. The effect of Mannitol is to take water from the brain and thus reduce the pressure. After reflection Dr Nowitzke considered that it was not the Mannitol that had caused the very low sodium level of 119. It could have been caused by the Tegretol or the brain pathology. Depending on the cause of the problem, the treatment would vary. Initially Dr Nowitzke would consider restricting the amount of fluid to redress the imbalance. Administering sodium needed to be done carefully and under supervision because of other neurological associated risks. He doubted that consuming water in accordance with advice to drink more would be causative of the condition of hyponatremia.

The point that Dr Nowitzke came back to repeatedly was that Mrs Dee's set of concurrent circumstances was most unusual and perplexing. He could not state to the court that had a different course been taken, then Mrs Dee would have survived. Obviously if she had been brought to hospital on the Thursday, the likelihood of investigation might have elucidated the situation and given her a better chance.

The seizures were either related to direct brain irritation from the subdural haematoma which is the probable explanation for the initial seizure or electrical abnormality related to the serum sodium being so low.

Dr Nowitzke's opinion that another CT scan should have been taken between two to four weeks after discharge was based on best neurological practice in his experience. Comparison of the CT images could then be made to consider whether the haematoma had changed.

I accept Dr Nowitzke's view that the haematoma had increased although only slightly from the first CT scan at Sunnybank to the second one taken at the Wesley Hospital. I am persuaded by Dr Nowitzke's argument that it is more accurate to compare two CT's than a CT scan against observations made at autopsy. He was sure that the haematoma had not decreased during this time.

Dr Nowitzke agreed that there was limited notation from the medical personnel on the discharge authority. Mrs Dee was discharged from the obstetrician's ward although at the time she may have been considered to be under the care of Dr Coroneos.

Dr Nowitzke questioned the readiness of Mrs Dee for discharge if she was still experiencing headaches to the extent that she was not able to get up and walk around, feed herself, etc. He would have expected a nurse notation to this effect.

He praised the thoroughness of Dr Coroneos referring Mrs Dee to a neurologist in three months to review her condition. He also commended the notation in the charts but there remained the contrasting, limited, clinical judgment and decision making when faced with phone calls from the patient's husband. In the absence of decreased levels of consciousness being reported by Mr Dee, Dr Nowitzke did not consider it likely that serum sodium tests should be ordered.

Further questions were asked by Mr Tait. He suggested to Dr Nowitzke that previous questioning had overstated the symptoms that Fiona was experiencing after discharge but as Dr Nowitzke raised, there is the issue itself of the patient's husband ringing the doctor and expressing concern.

Mr Tait did make the point that the increase in size of the haematoma, referring to the CT at the Sunnybank Hospital to the Wesley Hospital, was of the order of ten percent. Dr Nowitzke conceded that although this had caused midline shift which would cause symptoms, he would not expect that the increased size of the haematoma itself would cause Mrs Dee's death. The point being that a CT scan on the Thursday or even the Saturday would not have revealed a picture starkly calling for intervention. However, Dr Nowitzke stated that the CT scan must be read in the context of the clinical setting including a consultation to consider the whole situation. The haematoma was now causing midline shift and that would be a sufficient basis to consider surgery to prevent escalation of the problems. Had there been consideration of surgery, there would necessarily have been serum testing which would also have revealed the sodium level.

Dr Nowitzke also discussed the possible contributing effect of lack of oxygen to the brain immediately after the seizure. The ambulance officers had noted respiratory arrest. Lack of oxygen to the brain also contributes to swelling of the brain. He also noted that on arrival Mrs Dee had fixed pupils consistent with hypoxic injury to the brain. All these factors contributed to the overall seriousness of the condition and the ultimate death of Mrs Dee. The seizure event itself was critical in triggering the final rapid decline towards death.

Dr Genevieve Goulding gave evidence as an independent anaesthetist based at the Royal Brisbane Hospital. She has experience in vascular and neurosurgical anaesthetics as well as obstetric anaesthesia.

She agreed with Dr Jackson's estimate that more than 90 percent of elective caesareans would be performed under spinal anaesthesia. The spinal anaesthesia was preferable to epidural. It is quicker acting and dense which she explained as reaching both sensory and motor nerves. In comparison, an epidural block is outside the dura. A larger quantity of local anaesthetic is required and it takes longer. The muscle relaxation is not as effective. It was said to be *"by and large"* a safe procedure.

The most common complication of a spinal anaesthesia was a spinal headache, reported as one per cent. The hole made in the dura to administer the anaesthetic allows leakage of the cerebrospinal fluid causing a headache. The severity and duration of the problem can vary. Some situations resolve over time, others require treatment.

Ideally an anaesthetist would see the patient prior to the onset of the procedure but in reality it is often very shortly prior to the procedure that the anaesthetist assesses the patient and takes a history.

Dr Goulding indicated the best practice in recording notes would include the anatomical site of the anaesthetic, the size of the needle, any catheters and drugs recorded.

Dr Goulding thought the 27 Gauge needle would be the smallest type able to be used. Dr Jackson stated he injected into the T10 - T11 level. Dr Goulding remarked that it was recommended not to use a Whittaker needle above the level of the second lumbar vertebra, which is above level L2. The spinal cord ends at level 1 (L1) and there is a risk of damaging the spinal cord or nerves so it is recommended not to pass a needle above level 2.

Dr Jackson said he had passed the needle into level T10 - T11, in the thoracic region. Dr Goulding said she would not deliberately have chosen this level. She said there can be an error of one to two places which is why it is recommended to stay at or below level L3 in the lumbar area.

Further explanation was given that in pregnancy there can be puffiness even in the back region which makes it more difficult to exactly assess the level.[28]

The records, including blood pressure print out, indicated that administration of the anaesthetic did not cause any problems. The dose was appropriate. Ultimately, the placement of the needle at this level was not likely to increase the risk of subdural haematoma.[29]

The subdural haematoma which was discovered after Mrs Dee had collapsed and had a seizure post surgery was exceptionally rare in Dr Goulding's view. There can be variation in the presentation of such a subdural haematoma according to the literature. It is so rare an occurrence that Dr Goulding would not normally warn a patient about such a risk. She would warn about a headache but not of the rarer more serious risk.

[28] page 316
[29] page 324, line line 25

Dr Goulding confirmed that the recorded notes indicated a postural headache (puncture headache). Some self limit and some may continue for six weeks.

Dr Goulding would have been reluctant to offer an epidural blood patch where there was also a subdural haematoma. If conservative treatment did not resolve the problem and if the headaches worsened, then consideration would be given for an epidural blood patch. This procedure did not guarantee success (60-70% success) and was not without risks of failure, infection or other pain.

Dr Goulding reviewed the care in the intensive care unit and considered it appropriate. She would have herself ordered another blood test before Mrs Dee was discharged home to obtain a base line for medications and other levels within the blood.

After discharge Dr Goulding would expect the patient could access the treating team initially by telephone if there were any problems or concerns. Dr Goulding considered that she would still have seen the patient while in hospital even though her care had been delegated to another team. Significantly, in my view, Dr Goulding said, *"I probably wouldn't have done a blood patch. But I'd still be concerned because the whole thing arose as a result of the – if you like, down the track, as a result of the anaesthetic technique. I'm not saying it was caused by it but they were in some way related."*[30]

Dr Goulding was asked what her likely response would have been had she been contacted twice, two days apart, by Mrs Dee's husband after discharge, expressing concern over continuing headaches. It was put to her that on the second occasion, the husband had advised that Mrs Dee had been sick after taking Panadeine, there had been no improvement and he was worried.

Dr Goulding said her response would have been to tell them to come to the hospital to be seen by her or the obstetric physician that day.

She explained there would be no point in examining the spine regarding CSF leak as this is internal rather than external and not visible or palpable. Such a check would only be to dismiss possible infection.

As to whose decision it would be to perform an epidural patch or not, she said it was a complex situation. The involvement of the neurosurgeon meant it would more likely be that person's decision.

She considered it reasonable to manage the postural headaches conservatively given the small size of the needle and the further complication of the subdural haematoma. She also said it would be very uncommon to discharge a patient with a continuing postural headache.

She stated that the literature suggests postural headaches can continue for very long periods of time. She said that after Mrs Dee's admission to intensive care and return to the ward, her care was essentially an intracranial matter rather than still an

[30] page 315, line 48-53

anaesthetic matter. It could reasonably be considered the physician and or surgeon involved would be taking over that patient's care.

She expressed the opinion that she would inform patients of common side effects of medication. She also felt that given the overall seriousness of Mrs Dee's condition and that she was discharged with a review planned by Dr Coroneos at three months, she should have been monitored regarding the levels of Tegretol in her system.

Her views about monitoring blood levels with newly prescribed Tegretol were more demanding than that of the neurosurgeons who gave evidence.

I note the agreement of **Doctors Michael Besser** and **Peter Dohrmann**, both neurosurgeons, to the tendering and access to their reports which were created for a different forum. They independently reviewed Mrs Dee's treatment.

Both considered the overall diagnosis and treatment decisions of Dr Coroneos to be reasonable but with a caveat regarding the post discharge care. Both doctors indicated that the patient should have been reviewed after the reports of headache and vomiting a week after discharge

Dr Dohrman's view was similar to Dr Nowitzke, that an earlier review by CT scan was called for and, with hindsight, could have shown evidence of increasing mass and midline shift. Had this been done, surgical intervention would have been reviewed as well as necessarily requesting blood tests which would have revealed alteration in sodium levels. The significance was that Dr Dohrman thought consideration should always have been given to the possibility the haematoma could become a chronic subdural with greater risk to the patient.

Summary

The weight of evidence is that Mrs Dee suffered both a spinal leak and a subdural haematoma which are both rare complications of a spinal block anaesthesia procedure. Throughout Mrs Dee's hospitalisation the persistent postural headaches which are classic indicators of a spinal leak, were evident and continued upon her release. Of themselves, they were not a life threatening condition but extremely limiting and debilitating to a new mother wanting to actively care for her new born infant and other young child.

By the Thursday following her discharge from hospital, her husband was sufficiently concerned about her condition to telephone the neurosurgeon, Dr Coroneos. It is irrelevant whether this was first via Dr Coroneos' wife at the home number or via the mobile number. He was able to speak with Dr Coroneos. After hearing both Mr Dee and Dr Coroneos, I cannot accept Dr Coroneos as accurately relating the main import of that call. It may well be that in the course of that conversation the treatment plan was referred to but I do not accept that a query about the referrals in the treatment plan was the reason Mr Dee rang Dr Coroneos. I prefer and accept Mr Dee's evidence that he was worried about his wife's continuing headaches and was seeking advice. Dr Coroneos' response was to reassure Mr Dee and he might well have also reaffirmed the steps outlined in the treatment plan. However, I do not accept that the call was prompted by a query primarily to discuss that plan.

The call was brief and Mr Dee was essentially reassured that all was well and if he had further concerns he should feel free to telephone Dr Coroneos again. He did so, within two days, on Easter Saturday. It is quite unbelievable that Dr Coroneos could somehow construe that call to be a standard response to an invitation he said he had given Mr Dee to contact him. This invitation was said to be for Mr Dee to tell him how his wife was going a week after discharge. The second call was two days after the first and Dr Coroneos conceded there was a reference in that call to vomiting after taking Panadeine. Again I accept and prefer the evidence of Mr Dee to Dr Coroneos on this point. I find that Mr Dee rang specifically because he was worried his wife's headaches were no better and had now vomited after taking pain medication.

The evidence from phone records was that this conversation was short. I find there were no detailed questions from Dr Coroneos making suitable inquiry about any changes in the patient's condition, no request to speak with Fiona, no offer to see her or to refer her to be seen by any one else. There was no advice to take her to a hospital for review. There was no proper recognition of the potential for a serious problem now emerging in the patient's condition. I acknowledge that Dr Coroneos stipulated that if there were continual vomiting or other serious neurological sign like drowsiness, this would call for action. However, caution and good practice in such an unusual presentation of events as Mrs Dee had exhibited, called for her to be reviewed at that time. The weight of independent expert evidence was firmly with this view.

I acknowledge the benefit of hindsight but I have little hesitation in finding that the follow up phone call should have alerted Dr Coroneos to make further investigation, review or at the least refer Mrs Dee to some other doctor or facility to review her condition. Dr Coroneos should have been aware that the person ringing him was clearly concerned and was demonstrably not an overbearing, assertive or hyper vigilant person. Mr Dee was the person in the best position to be alert to his wife's condition and did all he thought he should do to seek assistance for his wife. Tragically this communication between Mr Dee and Dr Coroneos was not effective in achieving a review of her situation.

Mrs Dee collapsed the following day and was taken to the Wesley Hospital. She had suffered another seizure and had stopped breathing, requiring intubation. It was possible that she might also have suffered a cardiac arrest but this was not confirmed absolutely.

At the hospital it was discovered there had been a change in the subdural haematoma which had now caused midline shift. There was swelling of the brain and hypoxic injury. There was also another life threatening condition. She was suffering from hyponatremia, a very low sodium level. Again, the expert evidence was that it was likely this condition would have been causing some symptoms on the preceding day. The condition could have arisen as an unusual and unexpected side effect of the administration of the drug Tegretol. Mrs Dee's levels of the drug had been tested twice in the Sunnybank Hospital while she was in the intensive care unit and found to be normal. The consensus of expert opinion was there were no clear signs to indicate that blood tests should have been taken for serum levels in the weeks after discharge.

Hyponatremia as a side effect of Tegretol administration was again, one of those very unusual events that added to factors working against Mrs Dee's survival.

There were alternative explanations which might explain the low level of sodium. The proper administration of Mannitol at the Wesley Hospital, to reduce intracranial pressure, could have had the result of diluting the levels of sodium in the blood stream. The brain injury itself was said to also be a possible cause of lowered sodium levels.

At the time of Mrs Dee's final collapse at home there were again a number of possible explanations, all of which might have contributed to her death. There had been a largely inexplicable history of tachycardia whilst she was in the Sunnybank Hospital. Physiological causes of a cardiac nature were excluded by the cardiologist. This was confirmed subsequently at autopsy. It was possible but again unusual, that the emanation of the subdural haematoma had itself caused the cardiac response. There could have been another such response of tachycardia at the time of Fiona's final collapse as the subdural haematoma had by that time changed and caused midline shift.

Dr Nowitzke's considered opinion was that respiratory arrest at the time of her final collapse which was documented by the ambulance officers in attendance caused a hypoxic injury in the brain and added to the inevitable decline towards death. The cerebral hypoxia was related to either an epileptic seizure, described by family as collapse and fitting or the less likely cardiac event triggering the final decline. He thought it less likely that hyponatremia itself could have a causative relationship to the hypoxic injury to the brain.

Even after all the review that has occurred there remains uncertainty about the contributing and major precipitators of Mrs Dee's death.

It would not be helpful nor do I believe it would be accurate to say more than,

If Fiona had been brought to a hospital for medical review on the Easter Saturday, the chances of survival would have been significantly improved but not guaranteed. One would expect a CT scan would have been taken which might have shown the developing subdural haematoma. It is quite likely that standard blood tests would be ordered and the low sodium level would have been revealed. Treatment of this condition was said to be possible but not certain. Consideration of surgical intervention with respect to the haematoma might also have then been possible but not risk free.

Tragically, Fiona's developing medical conditions were exceptionally rare individually and ultimately overwhelming in combination.

I find that Fiona Jane Dee died in the Wesley Hospital at Auchenflower on 28 March 2005.

She had been admitted the previous day in a profoundly unconscious state after collapsing and experiencing a seizure at home. Ambulance officers intubated her and she was transferred to hospital. The previously diagnosed subdural haematoma had

enlarged slightly and progressed causing midline shift. Hyponatremia was also diagnosed as well as a further episode of tachycardia. She was suffering irreversible hypoxic injury to her brain which was swollen causing raised intracranial pressure and the herniation of her brain into the spinal column. Her condition was irretrievable and she died on 28 March 2005.

The cause of death was hypoxic brain injury due to a combination of factors arising from subdural haematoma. Those factors included hyponatremia, cerebrospinal leak and epileptic seizure arising from spinal anaesthesia administered for a caesarean section procedure.

Comments pursuant to section 45

Submissions from counsel have not invited coronial comment and have focused on the rarity of the individual case. However, I do consider there are opportunities for greater knowledge sharing which may help overall to prevent other tragedies.

In the course of evidence medical experts referred to *"the literature"* meaning articles written documenting unusual case history aimed to inform specialty practice. There have certainly been many reviews of Fiona Dee's history and opinions expressed but the opportunity may well remain for a proper review once some time has passed to enable impartial, scholarly review.

With hindsight there are opportunities for reflection on whether there was an optimum holistic team involvement in Mrs Dee's care. A review of the history might better inform the anaesthetist that this was a complex problem involving both post dural and subdural haematoma headaches. The rarity of these coalescing conditions called out for more collegiate discussion between the team at Sunnybank Hospital and also other neurological input.

I thank all legal representatives for their assistance in this inquest. To Fiona's husband, parents, family and friends I extend my sincere condolences. It was a tragedy that such a young woman with a young family should die so unexpectedly after the birth of her second child. I know that her memory will live on with you all and through the years as her children grow up.

The inquest is now closed.

Christine Clements
Deputy State Coroner
Brisbane
22 March 2007