

SOUTH



AUSTRALIA

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 8th day of February, 8th and 16th days of June, 2000, before Wayne Cromwell Chivell, a Coroner for the said State, concerning the death of Edmund James Fern.

I, the said Coroner, do find that Edmund James Fern, aged 30 years, late of James Nash House, Oakden, died at James Nash House on the 4th day of September, 1997 as a result of cardiac arrhythmia due to therapeutic clozapine use. I find that the circumstances of death were as follows:-

1. **Reason for inquest**

- 1.1 On 28 November 1996 Edmund James Fern appeared before Judge Wilson in the District Court of South Australia. He had been charged with two counts of armed robbery arising from separate incidents in July 1995, and one count of unlawful wounding arising out of an incident in the Adelaide Remand Centre on 18 November 1995. His Honour found Mr. Fern not guilty on the grounds of insanity on all three counts.
- 1.2 On 18 February 1997 His Honour made an order pursuant to Section 269O(1)(B) of the Criminal Law Consolidation Act committing Mr. Fern to detention, and fixed a “limiting term” of six years and six months commencing on 1 July 1995 on the armed robbery charges, and a cumulative limiting term of three years and six months on the unlawful wounding charge.
- 1.3 On 4 September 1997, the day of his death, Mr. Fern was detained at James Nash House at Hillcrest pursuant to His Honour’s orders. Accordingly, on that date he was “detained in custody pursuant to an Act or law of the State” within the meaning of

Section 12(1)(da) of the Coroners Act, and an inquest was therefore mandatory pursuant to Section 14(1a) of that Act.

2. **Background**

- 2.1 Mr. Fern had been accommodated at James Nash House on a continuous basis since 17 May 1996. He had been diagnosed as suffering from an adjustment disorder and chronic schizophrenia.
- 2.2 Mr. Fern had suffered from a severe nasal obstruction since 1989 as a result of an injury he had received at Yatala Labour Prison during a previous period of imprisonment. He had consulted Dr. Michael Schultz, a Consultant Otorhinolaryngologist at the Royal Adelaide Hospital.
- 2.3 Mr. Fern was transferred to the Royal Adelaide Hospital on 1 September 1997 and underwent an operation known as a septoplasty on 2 September 1997. Mr. Schultz said that the operation was a little difficult, but it proceeded uneventfully (Exhibit C.8a, p3).
- 2.4 Mr. Fern's psychiatric medication was continued while he was at the Royal Adelaide Hospital, and his medication record from James Nash House was placed in the RAH casenotes and transcribed on to the drug chart (Exhibit C.8a, p1). After the operation, Mr. Fern was prescribed cephalexin, an antibiotic, and Panadeine Forte, an analgesic, in addition to his psychiatric medication.
- 2.5 Mr. Fern was discharged from Royal Adelaide Hospital on 3 September 1997 and returned to James Nash House. Prior to discharge, the packs were removed from his nose, and the nursing note records that there was "nil nasal bleed on removal" (Exhibit C.8a, p4).

3. **Events at James Nash House on 3 and 4 September 1997**

- 3.1 When Mr. Fern returned to James Nash House at about 12.15p.m. on 3 September 1997, it was noted that he appeared unwell, his speech was slurred and his pupils were small (see the statements of the security attendants, J.S. Vivian, Exhibit C.9a, and R.B. Glastonbury, Exhibit C.10a).
- 3.2 On several occasions during the afternoon Mr. Fern appeared drowsy. His adoptive parents telephoned him during that time, and Mrs. Fern described his speech as

“incoherent”, he complained of feeling tired, and expressed concern that he had lost his watch and earring (Exhibit C.6a, p13).

- 3.3 Mr. Fern’s room-mate, Peter Rawson, described him as “bombed out”, and slurring his words (Exhibit C.11a, p2).
- 3.4 When Mental Health Nurse T.D. Patterson commenced duty at 7.00p.m., she found Mr. Fern sitting in Clare Ward instead of in Birdwood, where he should have been. She said that he was sitting on a chair, dozing, with a cigarette in one hand and a cup of Milo in the other (T.17).
- 3.5 Ms. Patterson escorted Mr. Fern back to Birdwood Ward. She noted nothing untoward about his demeanour. She said that he was excited, and “had lots of things to tell us about his visit to hospital” (T.18).
- 3.6 Ms. Patterson saw Mr. Fern twice more between 7.30p.m. and 8.00p.m., when he was sitting upright in a chair, snoring.
- 3.7 At about 8.40p.m. Ms. Patterson saw Mr. Fern again when he attended at the Nurses Station to receive his nightly medication. She described him as being “very chatty” then, his usual “bouncy, excited” self (T.21).
- 3.8 By reference to the drug chart in the casenotes, Ms. Patterson confirmed that she had dispensed the following medication to Mr. Fern that evening:-
- sodium valproate (1800mg);
 - chloral hydrate (1000mg);
 - clozapine (350mg);
 - cephalexin (500mg);
 - Panadeine Forte (60mg);
 - clonazepam (2mg);
 - amitriptyline (50mg).
- 3.9 At 9.00p.m. Nurses Lawlor and Grindley saw that Mr. Fern was asleep, so they helped him into an office chair and wheeled him to the bedroom he shared with Mr. Rawson. He stood up with assistance, and was helped into bed and placed on his left side, facing the wall. A piece of clothing was placed under the mattress to prevent him rolling on to his back (Exhibit C.13b, p5).

- 3.10 Ms. Patterson checked Mr. Fern at about 10.30p.m. when she escorted Mr. Rawson to bed. He was snoring loudly.
- 3.11 At about midnight Mr. Rawson shook Mr. Fern to try and get him to stop snoring. When he was unable to rouse him, Mr. Rawson called the nurses. Nurses Grindley and Lawlor attended, and Ms. Lawlor checked Mr. Fern, who was still snoring loudly. She leaned over and checked his face. He was breathing without apparent difficulty (Exhibit C.14b, p7).
- 3.12 Nurse Mary Wood said that she continued to check Mr. Fern during the night “probably half a dozen times”, until about 6.30a.m. She said that she heard snoring sounds throughout the night. She looked at him through the window panel on each occasion, and noted that he had not changed position. She was unable to see his face from that position (Exhibit C.19b, p7).
- 3.13 At about 7.45a.m. Nurse Peter Taylor went to wake Mr. Fern, but was unable to rouse him. On closer inspection Mr. Taylor noted that his lips were blue, and that there was blood around his nostrils and on the sheet. He was unable to find a pulse so he called for assistance (Exhibit C.18a). The Clinical Nurse Consultant, Mr. Edwards-Brown, attended with other nurses and resuscitation equipment was deployed. A Guedel’s Airway was inserted and Mr. Fern was lifted, while still on his mattress, to the floor so that cardio-pulmonary resuscitation (CPR) could commence.
- 3.14 Acting Clinical Nurse Glen Foster described what then occurred:-
- “Paul Baker entered the room and went to Eddie’s head with the oxygen, mask and bag. Stuart McPhie began CPR chest compressions while Paul Baker compressed oxygen through the oxygen mask. Stuart and I shared the role of doing chest compressions. When we first commenced chest compressions I heard evidence of what appeared to be fluid in the chest cavity. Paul then used the suction to remove any fluid through the airway. I can recall seeing and hearing an amount of fluid being suctioned out while I was assisting with chest compressions. Stuart and I shared the role of chest compressions for what appeared to be 5 to 7 minutes before the Ambulance arrived, while I was doing chest compressions. I then withdrew from chest compressions at the request of Ambulance officers. They took over treating Eddie and I went to the Nurses Office to commence documentation of the incident”. (Exhibit C.12a, p2).
- 3.15 Paramedic Phillip Knight and his partner, Peter Wright, arrived at 7.55a.m, and were taken to Mr. Fern’s room. Mr. Knight said that when the mask was removed from Mr. Fern’s face “I noted that his nose was very swollen and was occluded with copious

amounts of blood-stained mucous” (Exhibit C.20a, p2). When he removed the Guedel’s Airway “I noted that it was soiled and the mouth had dried mucous around it” (Exhibit C.20a, p2).

3.16 When Mr. Knight introduced a laryngoscope blade into Mr. Fern’s mouth, he said:-

“I noted the airway was impacted with dried blood/mucous matter. The airway was obstructed with this matter. I also noted that there was no respirations, the chest was not moving up or down and my partner informed me that the monitor was connected and I noted the rhythm of the patient to be asystole. I then checked the pupils with reaction to light and both left and right pupils were fixed, non-reactive to light and dilated. I checked for a carotid pulse and none was palpable”. (Exhibit C.20, p2).

After consulting with the others in the room, Mr. Knight did not proceed with resuscitation.

3.17 At 9.02am, Mr Fern’s life was formally declared extinct by Dr Milosevic (Exhibit C2a).

4. **Cause of death**

4.1 A post mortem examination was performed by Dr. R.A. James, Senior Forensic Pathologist, at the Forensic Science Centre on 5 September 1997. In his report (Exhibit C.3a), Dr. James described the cause of death as:-

“Undetermined. Unexpected death associated with high levels of anti-psychotic medication and analgesia”.

4.2 Dr. James confirmed that he found no sign of a blood clot blocking the airway (as alleged by Mr. Knight), nor did he find any sign of bleeding and aspiration of blood into the lungs (which may happen, particularly if the patient is heavily sedated). There was no more than normal bleeding at the surgical site (T.65), or in the nostrils or on the face (T.66, T.69).

4.3 Dr. James explained that the amount of blood on the nasal bolster and on the pillow does not suggest that Mr. Fern suffered a major haemorrhage. Further, the evidence of the nursing staff that they applied suction to the airway is inconsistent with the suggestion that the airway was “impacted”, since “a clot would be readily removed by suction” (T.72).

- 4.4 The evidence of the staff that they performed CPR for some time using manual chest compression and introducing oxygen into the chest under the pressure by use of a bag and mask is also inconsistent with Mr. Knight's suggestion (T.73).
- 4.5 Finally, if Mr. Fern had choked, Dr. James said that he would have expected to see other signs such as petechial haemorrhages, and he found no such sign (T.72).
- 4.6 Dr. James said that when he commenced the post mortem, he was aware of the recent history of a surgical procedure at the back of the nose, and that he expected to find:-
- “that there had been post-operative bleeding and either a blood clot that had dislodged from a surgical site and blocked the top of the airway, or in the alternative that post-operative bleeding had allowed liquid blood to run down the airway, and as it were, choke him from aspiration of blood while in a sedated state. That was my expectation and when I carried out the post mortem I couldn't see any evidence of that ... so I was left with a patient with that history and on those particular drugs. In Adelaide, as in all major centres, once or twice a year we see quite unexpected deaths of people who are receiving treatment for psychosis using usually high doses of anti-psychotic drugs. In those cases we generally find their death is unexpected and hasn't been preceded by any abnormal behaviour and we have a negative post mortem”. (T.64-5).
- 4.7 Dr. James quite happily accepted the suggestion of Dr. Buckley, whose evidence I will discuss shortly, that the most likely mechanism of death, if clozapine was involved, was a cardiac arrhythmia. Dr. James confirmed that such a condition leaves no sign at post mortem (T.66).
- 4.8 The evidence of Mr. Knight and Dr. James cannot be reconciled. If Mr. Knight's evidence is correct, then Dr. James should have found the blocked airway at autopsy. The only alternative explanation is that a third party has interfered with the body after Mr. Knight inserted his laryngoscope, and before Dr. James performed the post mortem. There is no evidence that this occurred, and it seems very unlikely that anyone would do such a thing. The removal of the impacted matter would have required specialised equipment. The question as to who might be motivated to do such a thing is unanswered on the evidence. In all the circumstances, I dismiss this as a possibility.
- 4.9 In those circumstances, I prefer the evidence of Dr. James to Mr. Knight. I conclude that he must have been mistaken when he found that Mr. Fern's airway was occluded when he examined him. The nurses worked on Mr. Fern using a bag and mask and chest compressions for a period of between five and seven minutes, on Mr. Foster's

evidence, and Mr. Foster heard evidence of a bubbling noise in the chest cavity indicating the presence of fluid (T.101). This could not have occurred if Mr. Fern's airway was completely occluded.

4.10 In all those circumstances, I find that Mr. Fern did not die from asphyxia.

5. **The role of the medication**

5.1 After three attempts, it seems that I now have a comprehensive toxicological analysis of the medication in Mr Fern's bloodstream at the time he died (see Exhibits C4a, C5a and C24). When these three reports are taken together, it can be seen that an analysis of Mr. Fern's blood taken at the post mortem examination revealed the following:-

• clozapine	1.3mg/L
• codeine	0.27mg/L
• morphine (metabolite of codeine)	0.03mg/L
• amitriptyline	0.18mg/L
• nortriptyline (metabolite of amitriptyline)	0.19mg/L
• trichloroethanol (metabolite of chloral hydrate)	11mg/L
• benztropine	nil
• clonazepam	nil
• 7-amino clonazepam (metabolite of clonazepam)	nil
• valproic acid	44mg/L
• alcohol	nil.

5.2 Dr. N.A. Buckley is Senior Consultant in Clinical Pharmacology and Toxicology at the Royal Adelaide Hospital, and is highly qualified to express an opinion on the toxic effects of chemicals on the human body. Dr. Buckley has provided me with two reports detailing his findings (Exhibit C.23 and C.23b).

5.3 Clozapine

Dr. Buckley explained that clozapine is an anti-psychotic drug which is used to treat a wide variety of psychiatric disorders that involve psychosis. It is "very sedative", and has fewer side effects of the movement disorder type than other drugs. Clozapine can cause a potentially fatal blood disorder called agranulocytosis, so regular checking of white blood cell levels if required. This was done in Mr. Fern's case and no such effect was noted.

5.4 Dr. Buckley said that the drug has been associated with a small number of sudden deaths, some of them due to myocarditis, and others have been attributed to arrhythmia, although this has not been proven (T.44). As I have already mentioned,

Dr. James also gave evidence that a death from arrhythmia cannot be proven at autopsy.

5.5 Dr. Buckley said that heavy sedation would increase the risk of clozapine causing an arrhythmia (T.57). He said that smoking increases the breakdown of clozapine in the system, and an increase of 33 percent or so in Mr. Fern's clozapine levels after he stopped smoking in July 1997 was consistent with this. The level increased to 0.316mg/L, which was still within the therapeutic range 0.2 to 0.7 (T.46). Mr. Fern started smoking again on 3 September 1997, but Dr. Buckley said that it would take several weeks for the clozapine levels to come down again.

5.6 The post mortem concentration of clozapine (1.3mg/L) is outside the therapeutic range and, as Dr. Buckley observed, requires some explanation. He said:-

“The first is that the effect of giving up smoking probably led to higher concentrations, although these were probably at the top of the therapeutic range. Secondly, therapeutic concentrations are serum concentrations, the post mortem concentration is from whole blood. Clozapine and other phenothiazines are weak bases concentrating inside red cells and may have higher whole blood concentrations than serum concentrations. Even when post mortem samples are taken from femoral blood, this may explain up to a five-fold increase in concentrations. Thus, while it is possible that he had a higher ‘toxic’ concentration it is more likely that this death occurred when clozapine concentrations were at the top of the normal range”. (Exhibit C.23, p4).

5.7 Panadeine Forte

Dr. Buckley described the dose prescribed here, two 30mg tablets as “quite a small dose” (T.47). At post mortem, there was both codeine and its metabolite morphine present in the blood. Morphine is the active chemical which produces the analgesic effect.

5.8 It has now been determined that Mr. Fern's blood contained 0.03mg/L of morphine. Dr. Buckley deduced that Mr. Fern had a total of between 5 and 11mg of morphine in his system at the time he died. He said:-

“This would be within the range of expected morphine concentrations after taking 60mg of codeine. It is a bit higher than would be expected ten to twelve hours after the last dose, although such extrapolations make many assumptions ... thus this concentration (0.03mg/L) of morphine on its own would not be expected to lead to death but may have contributed slightly to the overall sedative effect”. (Exhibit C.23b, 1-2).

5.9 Chloral hydrate

Dr. Buckley described this medication as a “fairly major sedative”, and said that its use nowadays is rather uncommon because the difference between a therapeutic and a lethal dose is unacceptably small (T.54). It has not been available on prescription since 1994, and Dr. Buckley was somewhat puzzled as to where James Nash House was getting it from (T.54). In his later report (Exhibit C.23b), he said:-

“... (it) is easily manufactured in hospital pharmacies, this is presumably the source of Mr. Fern’s chloral hydrate” (p.2).

5.10 It has now been established that the post mortem concentration of trichloroethanol, the active (sedating) metabolite of chloral hydrate was 11mg/L, which is within the “rough therapeutic range” of between 5 and 20mg/L. Dr. Buckley commented:-

“Thus the concentration of 11mg/L cannot be indicated to be a significant factor in the postulated cardiac toxicity. It may still have contributed to an overall sedative effect of the combination of a large number of sedative drugs (clozapine, amitriptyline, valproate, morphine and clonazepam (? - not found p.m.))”. (Exhibit C.23b, p2).

5.11 In conclusion, Dr. Buckley said:-

“On the basis of the additional evidence I still believe the most likely cause of death is a cardiac death from therapeutic use of clozapine. There may have been contributing factors of nasal obstruction and sedation from other drugs which would have decreased the ‘threshold’ for cardiac effects. Other drugs (amitriptyline, haloperidol, terfenadine) may have also contributed to the cardiac effects to a small extent”.(Exhibit C.23b, p2).

5.12 I accept Dr. Buckley’s opinion, and find that the cause of death was cardiac arrhythmia due to therapeutic clozapine use.

6. Other issues arising at inquest

6.1 Polypharmacy

Dr. Buckley expressed concern at the large number of drugs, many of which interact with each other, prescribed for Mr. Fern. His regular medications were:-

- sodium valproate (1800mg at night);
- benztropine (1mg during the day and .5 to 1mg as required);
- terfenadine (60mg during the day);
- chloral hydrate (1000mg at night);
- haloperidol (5 to 10mg as required);
- amitriptyline (50mg at night);
- clozapine (150mg in the morning, 350mg at night);
- omeprazole (20mg in the morning);
- clonazepam (2mg at night and .5mg as required);
- beconase, sorbitol, and nicorettes.

In addition to these, cephalexin (antibiotic) and Panadeine Forte (analgesic) were prescribed after his operation.

6.2 Dr. Buckley pointed out that a number of these medications had the same effect. For example:-

- benztropine is an anticholinergic medication which is designed to reduce the side-effects of anti-psychotic medication. Dr. Buckley said:-
 "... amitriptyline is already very anticholinergic as is clozapine, so there's really no need to throw in another anticholinergic drug" (T.58);
- "well in terms of odd combinations, you would have to say combining clonazepam and chloral hydrate which are two sedatives seems a slightly unusual thing, and I think certainly clonazepam is the safer of the two drugs" (T.58).

6.3 Dr. Buckley told me that, in his opinion, "more efforts could have been made to reduce the number of drugs he was on" (T.58).

6.4 This is an issue I have raised before (see Thompson - Inquest No.61/93). In that inquest, I recommended:-

- that the Medical Board of South Australia take urgent steps to remind the medical profession about the dangers of "polypharmacy", about their responsibilities for the monitoring and continual re-evaluation of medication being prescribed to patients, and of the need to form an independent judgment about the appropriateness of prescribing a particular medication, without relying upon the previous actions of other doctors in possibly different circumstances;

- that general practitioners, in particular, be reminded of the fact that medication they prescribe may have an additive and/or potentiating effect upon other medication the patient may be already taking, and that certain medications may accumulate to toxic and/or lethal levels in the body of the patient unless regular monitoring and re-evaluation is carried out.

It would seem that the circumstances of this case would indicate that that warning needs to be repeated.

6.5 Level of observation at James Nash House

The discharge form from the Royal Adelaide Hospital (both copies of which appear in the James Nash House casenotes, Exhibit C.22b) gave no instructions to the staff at James Nash House in relation to Mr. Fern's future care. The nursing discharge letter is no more informative, merely advising of an appointment in an outpatient department in six weeks time.

- 6.6 The nursing staff were alive to the necessity to monitor Mr. Fern's progress. For example, Ms. Patterson said that it had been mentioned during the handover at the start of her shift that they should maintain his level of analgesia, and should observe for haemorrhage by checking the bolster under his nose (T.18).
- 6.7 Mr. McGee, counsel for Mr. Fern's parents, submitted that the nursing staff should have entered the bedroom during the night to check for haemorrhage, rather than relying on observations through the observation window in the door. He pointed out that Mr. Fern was laying on his left side facing away from the door, and so they had no opportunity to check for haemorrhage from outside the room.
- 6.8 It would appear that the nursing staff, and Ms. Wood in particular, relied upon the fact that they could hear Mr. Fern snoring for reassurance. No doubt they were reluctant to enter the room unnecessarily in case they woke either Mr. Fern or Mr. Rawson, who also occupied the room.
- 6.9 I see no ground for criticising the nursing staff on the basis of the frequency of the checks - approximately six checks in a period from about midnight to 7.30a.m. seems quite reasonable to me in the particular circumstances where the staff were not on notice that Mr. Fern required special care. Although it would have been preferable for the nurses to enter the room once or twice during the night, it cannot be argued that this was relevant to Mr. Fern's death since he did not suffer a catastrophic

haemorrhage, and Dr. Buckley said that the fatal arrhythmia probably occurred without warning (T.57).

7. **Recommendations**

Pursuant to Section 25(2) of the Coroners Act, I recommend:-

- that the Medical Board of South Australia take urgent steps to remind the medical profession about the dangers of “polypharmacy”, about their responsibilities for the monitoring and continual re-evaluation of medication being prescribed to patients, and of the need to form an independent judgment about the appropriateness of prescribing a particular medication, without relying upon the previous actions of other doctors in possibly different circumstances;
- that general practitioners, in particular, be reminded of the fact that medication they prescribe may have an additive and/or potentiating effect upon other medication the patient may be already taking, and that certain medications may accumulate to toxic and/or lethal levels in the body of the patient unless regular monitoring and re-evaluation is carried out.

In view of Dr. James’ evidence, I see no reason to make recommendations in relation to the use of clozapine. However, I direct that a copy of these findings be forwarded to the Adverse Drug Reactions Advisory Committee of the Therapeutic Goods Administration.

Key Words: death in custody; psychiatric institution; clozapine.

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

Seal the 16th day of June, 2000.

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Coroner