



FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 15th, 16th and 17th days of December 2009 and the 25th day of October 2010, by the Coroner's Court of the said State, constituted of Mark Frederick Johns, State Coroner, into the death of Louise Cherise Cameron.

The said Court finds that Louise Cherise Cameron aged 32 years, late of 19/39 Holman Road, Christie Downs, South Australia died at Christie Downs, South Australia on the 12th day of May 2008 as a result of ischaemic heart disease complicated by upper gastrointestinal haemorrhage. The said Court finds that the circumstances of her death were as follows:

1. Introduction and reason for Inquest

- 1.1. Louise Cameron, aged 32 years, died on 12 May 2008 at her home address. She had presented at the Noarlunga Health Service (NHS) Emergency Department the previous day and had been discharged. A post-mortem examination was carried out by Professor Byard, forensic pathologist, who gave the cause of death as ischaemic heart disease complicated by upper gastrointestinal haemorrhage¹, and I so find.
- 1.2. In his autopsy report Professor Byard made two significant anatomical findings. The first was thrombotic occlusion of the left anterior descending coronary artery with hypoplasia of the right coronary artery and myocardial fibrosis. The second significant finding was gastric vascular ectasia with intestinal haemorrhage. Professor Byard commented that death was due to recent coronary artery thrombosis associated with thickened intramural coronary arteries and hypoplasia of the right coronary

¹ Exhibit C3a

artery ostium. He said that the presence of interstitial scarring within the heart indicated that there had been previous ischaemic damage. He also commented upon the presence of intestinal haemorrhage due to gastric vascular ectasia which he said is a rare disorder in which there is dilation of vessels within the mucosa of the stomach associated with haemorrhage. He commented that it remained uncertain after autopsy whether the coronary thrombosis preceded the upper gastrointestinal haemorrhage but noted that it was possible that the haemorrhage resulted in dehydration which may have precipitated thrombosis within the left anterior descending coronary artery with resultant myocardial ischaemia.

2. Background

- 2.1. I heard evidence in this matter from a friend of Ms Cameron's, Karen Jenkinson, who accompanied her to the NHS on the day preceding her death. I also heard from the medical practitioners who attended upon Ms Cameron at the NHS and a general practitioner who briefly examined her before referring her to the NHS. Finally, I heard from Professor Kelly, Emergency Physician and Professor of Emergency Medicine at Western Health in Footscray, Victoria.
- 2.2. Ms Jenkinson said that she was a friend of Ms Cameron and had known her for some 6 years. She said that Ms Cameron was a schizophrenic with no other health issues and was managing her schizophrenia quite well. On 11 May 2008 Ms Jenkinson visited Ms Cameron and found that she was unwell and complained that she felt bad in the stomach and was vomiting up black granules². Ms Jenkinson said that Ms Cameron looked pale and was sweating profusely. She offered to take Ms Cameron to see a general practitioner and an appointment was made for that purpose. The general practitioner who saw Ms Cameron referred her immediately to hospital. Ms Cameron was taken straight to the NHS by Ms Jenkinson and the latter's husband. Ms Jenkinson said that they were admitted to a cubicle in the Emergency Department within a short time after arrival at the NHS. By this time Ms Cameron was in a great deal of pain and was asking for pain relief. After approximately 2 hours, during which Ms Cameron was examined by medical staff and was provided with some medication, Ms Cameron was discharged from hospital with further medication to take home. Ms Cameron was feeling better and was driven to her home by Ms Jenkinson. The following day Ms Jenkinson found out that Ms Cameron had died.

- 2.3. The general practitioner's medical notes³ record that Ms Cameron was complaining of chest pain associated with profuse sweating, some back pain and an episode of vomiting. The general practitioner found her to be alert but uncomfortable and pale. Her pulse was recorded as 80 beats per minute and her blood pressure was 118/70. Her chest was clear and a provisional diagnosis of 'chest pain + autonomic changes ?cardiac' was made. She was referred urgently to hospital for further assessment. There was no mention in that consultation of vomiting black granules or chunks, nor of passing such material in her stools.
- 2.4. The NHS notes⁴ show that Ms Cameron was triaged category 2 at 1555 hours by the Emergency Department. The triage category 2 indicated that she had a high priority for medical assessment. The triage notes record normal vital signs, a pain score of 8/10 and a 'pale/ashen' appearance. The history on this document records 'sudden back and central pain at 1200 radiates down arms; vomited 'black chunks'; says bowel action 'black'. No relief with Panadeine Forte. Says abdominal pain last PM'. A past history of cigarette smoking, schizophrenia, back pain and anaemia is recorded along with her medications Zolof and Olanzapine.
- 2.5. Ms Cameron was seen by a first year medical officer initially, shortly after admission at 4pm. That medical officer reported that Ms Cameron reported chest pains and requested pain relief. The medical officer ordered titrated intravenous morphine. Ms Cameron repeated her history of a sudden onset of chest pain from about midday that radiated to both arms and was rated 8-9/10 in intensity. She reported nausea and sweating and the pain was described as sharp, stabbing and localised to the sternum. She also reported having vomited for a few days and passing a black chunk in her vomit the night before and black chunks in her stools that morning. Examination of the chest and abdomen were performed and did not reveal any abnormalities. Professor Kelly considered it notable⁵ that at this point the medical officer did not perform a rectal examination to identify melaena⁶. The medical officer considered that cardiac issues were unlikely and made a provisional diagnosis of oesophagitis. An electrocardiogram (ECG) was taken which was seen by the medical officer and a senior doctor. The senior doctor considered that the ECG report showed no acute

² Transcript, page 12

³ Exhibit C9

⁴ Exhibit C12a

⁵ Exhibit C20

⁶ Altered blood in the stool giving it a black colour suggestive of internal bleeding

ischaemic or ST elevation that needed immediate dealing with, although she did acknowledge in her evidence that the ECG showed changes that did indicate some older cardiac problems⁷.

- 2.6. Another senior medical practitioner attended with the medical officer to examine Ms Cameron. Part of that examination included an attempt by the senior doctor to clarify the nature of the 'black chunks' in the stool. There was a further abdominal examination, but again no rectal examination. There was a dispute in the evidence about a conversation that may have taken place between Ms Cameron and the senior doctor on this occasion. The medical officer recalled that Ms Cameron commented that she thought there was a problem with her heart and that, in response, the senior doctor assured her it was not her heart. The senior doctor had no recollection of having said this. In the result, it is unnecessary for me to make a finding about that matter. The senior doctor suggested that pantoprazole be prescribed⁸.
- 2.7. Ms Cameron spent approximately another 90 minutes in the Emergency Department during which time she continued to request pain relief. Mylanta was given and a voltaren suppository was also given. Blood tests were taken which revealed normal electrolytes, a haemoglobin of 89g/L (quite low) with a microcytic, hypochromic pattern consistent with iron deficiency, a white cell count of 18.1 (high), a neutrophil count of 14.3 (high) and a reticulocyte count of 128 (high). A single troponin T assay was recorded as <0.03. Ms Cameron was eventually discharged at about 1755 hours.
- 2.8. The various medical practitioners who saw Ms Cameron at NHS had differing accounts of what transpired. The situation was complicated by the loss of some medical notes which were written on a loose page and not in the medical file maintained for Ms Cameron. A discharge letter to Ms Cameron's general practitioner was also written but did not find its way onto her file and the file is therefore incomplete. No other copy of the discharge letter has come to light. As a result, it is difficult to draw conclusions about the inconsistencies between the various doctors' recollections. In the result I do not consider it is necessary for me to do so.

⁷ Transcript, page 209

⁸ Pantaprazole is an anti-acid treatment

3. Treatment at Noarlunga Health Service inadequate?

- 3.1. Professor Kelly considered that there were two omissions in Ms Cameron's treatment at the NHS. The first was the assessment of the chest pain and the second was the assessment of the history of black chunks in her stools and vomit.
- 3.2. The chest pain was, in Professor Kelly's opinion, possibly consistent with an acute coronary syndrome⁹. Professor Kelly commented that the chest pain was only briefly assessed with an ECG and a troponin T blood test taken on arrival at the hospital, however there was no follow-up troponin test and an ECG is not necessarily a reliable means to detect a heart attack at an early stage¹⁰. Professor Kelly said that the blood test is a more reliable indicator but it needs time to record cardiac damage and it is usually recommended that a patient have two tests some hours apart. In this case only a single test was done. Professor Kelly considered that in the result there was an inadequate assessment of Ms Cameron's reported chest pain and that this was a significant issue¹¹.
- 3.3. Professor Kelly also commented that the reported black chunks in the vomit and stools were an important clue to the potential of bleeding inside the gastrointestinal tract which often manifests itself as black bowel motions¹². Professor Kelly was firmly of the opinion that it was important to carry out an examination to check if there was blood in the intestinal tract by doing an examination of a stool from Ms Cameron, and in the absence of a stool for examination, a rectal examination to test for blood in the faeces.
- 3.4. Professor Kelly was of the opinion that had a rectal examination been performed, it is likely that blood would have been detected in the gastrointestinal tract which would have resulted in an admission to hospital. It may also have resulted in a blood transfusion and, if this had occurred, it was possible that the fatal heart attack that was the final mechanism of death, might have been averted.
- 3.5. Professor Kelly explained that the internal bleeding from Ms Cameron's gastrointestinal tract would have caused her to drop her blood pressure reasonably

⁹ Transcript, page 247

¹⁰ Transcript, page 247

¹¹ Transcript, page 247

¹² Transcript, page 247

suddenly¹³ and precipitated myocardial infarction¹⁴. She also commented that Ms Cameron's chronic anaemia would have meant that her heart might well be receiving less oxygen than normal, and the further compromise in blood supply from a dropping blood pressure may have been the precipitant for an infarction.

- 3.6. Professor Kelly agreed that the ECG report did not show any acute damage. However, it did contain a note at the top of the report that the ECG was abnormal and that it was not possible to rule out anterior myocardial infarction. Professor Kelly said that a close examination of the graphs on the ECG demonstrated that there were some 'Q waves' which are a downward deflection in the graph line. These are often indicative of previous cardiac damage which would suggest that the patient was at risk of further cardiac damage and should have caused the staff to question what was occurring to explain the Q waves¹⁵. Professor Kelly said that, in her opinion, there should have been a further blood test for troponin level between 3 and 4, or as late as 8 to 12 hours after the first test, depending on the testing available at the NHS¹⁶.
- 3.7. Professor Kelly acknowledged that the fact that Ms Cameron was quite young at 32 years of age, and female, may have caused the staff to discount the possibility of acute coronary syndrome¹⁷. However, she was still of the opinion that they should have considered it¹⁸.
- 3.8. Professor Kelly acknowledged that the interaction between Ms Cameron's two conditions significantly increased her risk of death because one of the major treatments for heart disease involves the provision of medication for thinning the blood. This would in itself make the gastrointestinal bleed more dangerous and so there was a complex interaction between the two conditions. She said that had both conditions been detected, Ms Cameron's chances of survival would have been quite reasonable. If only one of the conditions had been detected she would still have been at considerable risk¹⁹.
- 3.9. It was clear in Professor Kelly's opinion that if either the gastrointestinal bleed had been picked up by rectal examination, or the cardiac issue had been detected

¹³ Bearing in mind her young age

¹⁴ Transcript, page 249

¹⁵ Transcript, pages 253-254

¹⁶ Different tests have different detection rates at different time intervals, see Transcript page 255

¹⁷ Transcript, page 256

¹⁸ Transcript, page 256

¹⁹ Transcript, page 258

following a repeat troponin T test, Ms Cameron would certainly have been admitted to hospital²⁰. Professor Kelly provided a useful protocol for acute coronary syndrome entitled 'Management of Chest Pain/Suspected Acute Coronary Syndrome' which was admitted²¹.

3.10. Finally, I received an affidavit exhibiting a statement of Dr Diane King of the Flinders Medical Centre Emergency Department who is the Director of Emergency Services there²². Dr King said that, as a result of Ms Cameron's presentation, discharge and subsequent death, and a consideration of her autopsy findings and the report of Professor Kelly²³, an internal inquiry was conducted into the Emergency Department of NHS and changes have been implemented. The changes are as follows:

1. The process for assessment and management of patients with chest pain has been reviewed and more detailed guidelines with specific expectations and alerts were distributed in August 2008.
2. The expectations of senior doctors on shift have been clarified in order to provide improved decision making and support to junior doctors.
3. The emergency physician support to Noarlunga Health Service has increased with the expectation that supervision of junior medical staff will improve. The specialist support is required for extended hours, seven days per week and, pending recruitment at this level, there has been focus on supporting GP Consultants in a supervisory role. Currently six shifts per week are covered by emergency physicians with the aim to increase it to fourteen .
4. A comprehensive education programme for junior doctors is in place and this is run by emergency physicians. The assessment and management of chest pain is included in this programme.
5. Morbidity and mortality meetings are held in ED monthly to assist medical and nursing staff to maintain their alertness to high risk clinical presentations and situations.

²⁰ Transcript, page 257

²¹ Exhibit C20a

²² Exhibit C14

²³ Exhibit C20

4. **Recommendations**

- 4.1. In view of the material contained in Dr King's affidavit²⁴, it seems that steps have been taken as a consequence of Ms Cameron's tragic death. In those circumstances, it is not necessary for me to make any recommendations in this matter. However, I do draw to the attention of the NHS Emergency Department the protocol produced by Professor Kelly entitled 'Management of Chest Pain/Suspected Acute Coronary Syndrome'. This protocol seems eminently sensible and could be readily deployed at NHS.

Key Words: Ischaemic Heart Disease; Multiple Diagnoses; Inadequate Examination

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

Seal the 25th day of October, 2010.

State Coroner

Inquest Number 37/2009 (0647/2008)

²⁴ Exhibit C14