



## **CORONERS COURT**

# **FINDINGS OF INVESTIGATION**

**CITATION:** **Non-inquest findings into the death of Joanne Hemsley**

**TITLE OF COURT:** Coroner's Court

**JURISDICTION:** Brisbane

**DATE:** 25 October 2016

**FILE NO(s):** 2013/3722

**FINDINGS OF:** Christine Clements, Brisbane Coroner

**CATCHWORDS:** CORONERS: Health care related death, complication from elective percutaneous stenting of left descending artery, patient discharged too early following procedure, adequacy of documentation and communication

## Introduction

1. Ms Joanne Hemsley, was a 55 year old woman who lived at 23 Tamborine Street Loganholme in Queensland. She worked as a mental health support worker. She had a long history of cigarette smoking but ceased smoking in September 2013 following a heart attack on 21 September 2013. She also had a history of hypertension, dyslipidaemia, hypercholesterolemia, depression and hiatus hernia.
2. On Sunday the 13 October 2013, at 06:30, the Queensland Ambulance Service (QAS) and Police were called to attend Ms Hemsley's home as she had been found deceased in the bath tub by her daughter at approximately 05:30. Despite resuscitation measures, she was unable to be revived and was pronounced deceased at the scene.
3. Ms Hemsley's death was reported to the Coroner under the *Coroners Act 2003* because it was considered that it may be a health care related death associated with recent treatment she had received at the Princess Alexandra Hospital (PAH).

## Chronology of events

### ***The Queensland Ambulance Service are called to attend Ms Hemsley on 21 September 2013***

4. On the 21 September 2013, at approximately midnight, Ms Hemsley phoned the QAS complaining of central chest pain since about midday. On arrival, the pain was described as intermittent at first but then became constant from about 21:00 on the previous night. She was fully conscious and described her pain in her back and radiating into both arms. She stated the pain was 8 out of 10 in severity. An Electro Cardio Gram (ECG) showed abnormalities in the rhythm of her heart, indicating an ST elevation myocardial infarct (STEMI) in the inferior leads. This was suggestive of myocardial infarction, a heart attack.
5. Ms Hemsley was treated according to QAS protocol for heart pain with aspirin, sublingual (under the tongue) nitro-glycerine (GTN), morphine and oxygen. A Critical Care Paramedic (CCP) support unit was summoned to the scene. She required 15 mg intravenous morphine as well as 5 doses of GTN before her pain became reasonably controlled.
6. At the scene, she was treated by the CCP who triaged Ms Hemsley directly into the PAH cardiac catheter laboratory following consultation with an on-call cardiologist.

### ***Ms Hemsley's enrolment in the Atlantic Study***

7. At the time, the QAS was a participating site in an International multi-centre clinical trial known as the 'Atlantic Study'. This trial was designed to evaluate the efficacy and safety of pre-hospital versus in-hospital initiation of the drug Ticagrelor (platelet inhibition agent) to STEMI patients where there was planned

treatment of heart attack with percutaneous stenting of the coronary artery, (PCI).

8. Ms Hemsley was enrolled into the Atlantic Study by the critical care paramedic.
9. The Atlantic Study was a Phase IV clinical trial. This means the efficacy and safety of Ticagrelor had already been established for reperfusion of STEMI patients. The study was done to compare the relative benefit of a reduced delay to the patient receiving Ticagrelor. The trial successfully identified benefit to patients.
10. The Atlantic Study including the consent process for enrolment, was approved by the Metro South Hospital and Health Service Human Research Ethics Committee.

***Ms Hemsley's admission to the Princess Alexandra Hospital on the 21 September 2013***

11. Ms Hemsley was transported to the PAH for investigation arriving at approximately 02:00.
12. She was seen by the PAH emergency department doctors who diagnosed her with an acute myocardial infarct.
13. At approximately 02:15, she was seen by the on-call Consultant Cardiologist for interventional cardiac procedures.
14. She was taken to the coronary catheter lab where the following procedure was carried out by the Consultant :
  - a coronary angiography with left heart catheterisation; (threading small catheter up artery to inject dye under x ray to identify site of any blockages;
  - A left venetricylography; and
  - Insertion of a stent into single coronary artery, the circumflex coronary artery.
15. The angiography demonstrated that Mrs Helmsley had a complete occlusion of a coronary artery the Circumflex Artery (one of the three main arteries). It was considered that this was likely the culprit vessel causing the myocardial infarct. She also had a tight 90% lesion in the proximal Left Anterior Descending Artery (LAD). The Consultant's plan was to re-open the Circumflex Artery to restore blood flow to the affected myocardium [heart muscle], allow her to recover from the acute myocardial infarct, then arrange for Mrs Hemsley to have further stenting on her LAD artery in the near future as per the practice guidelines (presuming she remained clinically stable).
16. The LAD artery carries the main blood flow to the heart muscle, so the Consultant considered intervening in the middle of an acute infarct would only be appropriate if this was the vessel causing the presentation. Otherwise there

was a risk of destabilising an already physiologically stressed heart muscle, which can cause fatal complications.

17. The Consultant stated he successfully stented the circumflex coronary artery by placing a small metal tube through the obstructed artery. He said Ms Hemsley was free of chest pain and her ECG normalised suggesting that blood was now reaching the heart muscle previously cut off by the acute circumflex obstruction. He left the hospital and was not contacted by staff overnight.
18. Following the procedure, Ms Hemsley was admitted to the coronary care unit (CCU). She complained of chest pain the following night of a similar nature to her previous chest pain prior to her admission. It was documented by nursing staff that there were no ECG changes and she was treated with Panadol with no effect but Gastrogel (for indigestion) which was given later had good effect. The registrar was notified and "was not concerned" although he/she did not review her. On the ward round the following morning the registrar noted that she had "the same pericarditic (inflammation of tissue around the heart) pain overnight, otherwise well".
19. She was taken off cardiac monitoring and allowed to mobilise around the ward. She was reviewed by an occupational therapist, social worker and cardiac rehabilitation services. Her cardiac enzymes were noted to stabilise with Troponin-I peaking at 6.5 on the 21<sup>st</sup> of September and dropping to 1.8 by the 23<sup>rd</sup> of September; and creatinine kinase (CPK) peaking at 897 at 12:30 on the 21<sup>st</sup> of September, dropping to 650 by 20:20 pm that evening.
20. There was no further report of pain and Ms Hemsley was discharged on the 23<sup>rd</sup> September 2013. She was referred to the pharmacy for assistance in quitting smoking and it was arranged that she would return electively for stenting to the LAD in two weeks.

***Ms Hemsley's procedure on the 11 October 2013***

21. Ms Hemsley returned for elective Percutaneous Coronary Intervention (PCI) stenting of her left anterior descending artery (LAD) on Friday, 11 October 2013. She reported four episodes of central chest tightness, always at rest after sitting for a long time. Her pain was relieved by GTN spray.
22. As Ms Hemsley indicated that she still had groin issues (bruising) from the last procedure, the Consultant elected to perform the procedure via the radial (wrist artery) route.
23. The Consultant says that Mrs Hemsley was "uptight and anxious" about the procedure. He says that he explained the procedure to her and distinctly remembers having a very specific discussion regarding a small diagonal coronary artery branch coming out of the narrowed portion of the artery, which was evident on the previous films.
24. The Consultant stated he explained that to pass a stent across the narrowed portion of the LAD would likely mean that this small branch may be cut off from the LAD artery (as the wall of the stent would block the opening to the artery).

The artery was small and the territory of heart muscle it supplied was also correspondingly small. He said they discussed this might cause chest pain, but should not significantly damage the heart muscle, because the vessel and area of heart it supplied was small. There is no record of this discussion made by the Consultant or anyone else.

25. Despite her anxiety, Mrs Hemsley was able to agree to the procedure. It was explained that without treatment, the ongoing nature of her chest pain suggested that a myocardial infarct [heart attack] was likely, indeed imminent, given the recent chest pain history. The LAD lesion required treatment by stenting to prevent a heart attack.
26. Ms Hemsley was provided with additional sedation, a total of 3 mgs of IV Midazolam (a moderately short acting intravenous sedative) and 50mcgs of IV Fentanyl (a moderately short acting intravenous opioid narcotic). This was to assist with relaxation and to provide pain relief to make the procedure more tolerable. Although access to the radial artery is performed using local anaesthetic, the Consultant stated Ms Hemsley still found the procedure uncomfortable.
27. The Consultant arranged for an initial view of the LAD artery to confirm the current anatomy of the lesion. This 'set up shot' confirmed a tight lesion in the LAD and also the patency of the previous circumflex stent done three weeks previously. The Consultant did not re-check the Right Coronary Artery at this admission as this was not standard practice (and contrast dye can cause dose related kidney dysfunction) and there was no acute indication requiring this to be performed on this admission.
28. The right coronary artery did not have significant disease angiographically three weeks prior, although it is noted that there are some diagnostic limitations with angiogram. Specifically, angiography only shows the internal 'space' or lumen of the vessel (i.e. luminogram), so a vessel may appear relatively patent once dye is injected (particularly as the vessel is potentially elastic), but may still have significant pathology in the wall of the vessel. Other assessment modalities are required to look at the disease load in the vessel wall itself (e.g. intra-coronary ultrasound). Angiogram only assesses whether there is impairment of flow.
29. The Consultant did also not perform an LV gram [x-ray measurement of the heart's contractility by visualising dye being pumped out of the heart], as he did not consider there was clinical need. He said the reason for this was because he already had the information of the LV function on the angiogram from her previous admission.
30. The Consultant considered that the LAD lesion appeared a little hazier than the previous angiogram pictures had demonstrated, suggesting the possibility that a clot had formed in this vessel at the site (possibly the cause of the multiple episodes of chest pain she had been recently experiencing). (There was no note made of this.)

31. It suggested to him that the chest pains may have related to incipient small heart attacks in this territory over the last few weeks. The LAD lesion itself was a discrete lesion with a short segment of stenosis and adjacent plaque, hence he did not plan to do thrombosuction (where an acute clot is 'sucked out' of the vessel).
32. The Consultant states that he tried to directly stent the LAD initially without prior balloon dilatation but found it difficult to pass the stent. He therefore decided to pre-dilate the lesion first with a balloon and then to insert the stent. The pre-dilatation was performed. This involves briefly obstructing the lumen while the balloon is inflated to 'squash' the diseased vessel wall to allow the vessel to open. After pre-dilatation Ms Hemsley began complaining of chest pain.
33. The Consultant therefore arranged for her to receive nitro-glycerine into the coronary artery (to assist with dilating the artery) and arranged for further sedation to be given.
34. An angiogram of the flow through the dilated LAD demonstrated that there was poor flow through a small diagonal artery arising from the diseased portion of the LAD (as noted prior to the angiogram and discussed with Ms Hemsley). The Consultant elected to preserve the main vessel, as there were no ECG changes and it was a small branch supplying a small area of heart muscle. To put this vessel in context, the diagonal artery had a diameter of 1 mm, which was smaller than the 2.25mm smallest stent that is available.
35. In his statement, the Consultant noted that there also appeared to be a small dissection (tear) in the artery wall where the balloon had inflated. A stent was deployed and which covered the lesion and the small 'dissection' in the LAD following the balloon angioplasty. The Consultant indicated that there was good flow in the LAD vessel, although the diagonal vessel was occluded (as anticipated).
36. Ms Hemsley still had chest pain, which the Consultant says he considered to be from the occluded small diagonal vessel (as the other vessels were patent). There were no EGG changes (on the electronic EGG monitor) following the stent, so it was arranged for post-dilation of the stented lesion with a balloon. The Consultant states that he took pictures after the wire removal of the state of the LAD. At this point there was no further flow down the diagonal vessel, suggesting that an infarct of this territory of the heart was inevitable, given the stent had now occluded the origin of this small vessel, as anticipated.
37. The procedure was completed and Ms Hemsley was moved to the recovery area. The Invasive Devices Log indicates the PIVC was inserted at 11:00.
38. Shortly after the Consultant commenced typing his procedure report, one of recovery nurses informed him that Ms Hemsley had 9/10 (severe) chest pain. The Consultant attended to Mrs Hemsley immediately.
39. On review, Ms Hemsley was haemodynamically stable. Her EGG did not show any ST elevation (a marker of ischaemic [oxygen depleted] heart muscle and

heart attack) on the portion of the EGG (anterior leads) corresponding to the LAD vessel where the stent was placed [the anterior (front) wall of the heart]. This suggested that the stent was functioning appropriately. However, there was ST segment depression in the inferior leads (the portion of the EGG corresponding to the bottom of the heart), suggesting that this territory was experiencing angina, and minor ST segment elevation in lead AVL.

40. The Consultant's impression was that these EGG changes were arising from the diagonal vessel occlusion, although at this stage they suggested ischaemic [oxygen deplete stressed] heart muscle but not yet an infarct [heart attack].
41. Alternatively, it was possible that some of this change arose from clot debris travelling down the vessels after balloon angioplasty and stenting causing distal embolization of the smaller LAD vessels. To explain, where the LAD wraps around the apex of the heart it can sometimes lead to EGG changes that can be noticed in the inferior leads. Neither of these issues could be addressed angiographically, so he decided to continue with medical management.
42. The Consultant states that he provided Ms Hemsley with reassurance that the procedure that had been carried out was likely causing the pain. He says that they did not discuss the specifics of the 'dissection' or the stent obstruction of the small diagonal branch given her distress and anxiety (which can cause additional stress on the heart). The Consultant arranged for her to be given IV Morphine and a nitro-glycerine patch (the equivalent of Anginine given by a skin patch), used to dilate open the coronary arteries.
43. The Consultant states that he then went to complete his report but due to the interruption forgot to document the occlusion of the diagonal vessel as a complication arising from the procedure. Nor was the small tear (dissection) of the left anterior descending artery which occurred when the balloon was inflated noted in the records. He says that he only realised this error on Monday the 14<sup>th</sup> of October 2013. He did however note other complications (radial artery spasm and chest pain without ECG changes) that had occurred. The procedure report records medication administered (heparin) commencing from 14:31. And concluding with glycerol trinitrate at 15:22. The report was electronically signed off at 15:39.
44. The Consultant says that he was still present in the reporting room trying to do other reports about half an hour later when the Angioplasty Fellow, informed him that Ms Hemsley was still having pain. He reviewed the angiography images and discussed that it was likely the small diagonal branch occlusion that was causing the pain. They discussed whether there were any other options and agreed that a vessel of such small calibre would not be able to be salvaged without significant risk (if at all) and it was appropriate to continue to treat Ms Hemsley with expectant medical management, as was occurring. There is no notation of this discussion either.
45. He says that before he left for the day he went back to Ms Hemsley and looked at the most recent ECG. There was still no anterior ST elevation (which would

have suggested an infarct in the stent territory). The ECG changes in the inferior leads were still present, but to a lesser degree, and the ST elevation in lead AVL was also less. This was taken one hour after the first ECG done at 16:30. The Consultant ordered that a dose of 50mg Metoprolol be given (both as an anti-anginal agent, an antihypertensive, and as post infarct treatment), rather than waiting for the usual 8.00 pm dose that had already been charted.

46. The Consultant left at 17:30 and handed over the care to the recovery team. He called the recovery room at about 21:00 and was informed Ms Hemsley was sleeping and her pain had settled by about 20:00. He was reassured.

***Ms Hemsley's post procedural care in the Coronary Care Unit***

47. The first nursing entry in the CCU was recorded at 20:00 on evening of procedure on 10 October 2013. She was stable with no anxiety or pain and was being weaned from intravenous morphine. The radial access site was checked and no abnormality noted. However her blood pressure was charted at 20:00 at 155/80. (Previous reading upon admission prior to procedure was 113/77.) A GTN patch was applied.
48. At 06:00 on 12 October 2013 the next set of observations was taken. Her blood pressure was still relatively high but otherwise she was described as haemodynamically stable and afebrile. She complained of indigestion and was given gaviscon with good effect. She reported not sleeping well. She said she was "feeling ok this morning. She was seen during the morning ward round by Cardiology Registrar (advanced training). His entry in the chart seems to be incorrectly dated 11 October 2013 but follows the nursing entry of 06:00 on 12 October 2013.
49. The Registrar states that there was no record in the procedure report or in the patient notes of any concerns suggesting the need for Ms Hemsley to have serial cardiac enzymes done or more than routine monitoring for this admission.
50. When the Registrar asked how Ms Hemsley was feeling, she reported that she was anxious and had not slept well which she attributed that to not liking hospitals. She reportedly told him that she was feeling ok, denied any pain and was very keen to go home.
51. The Registrar noted that Ms Hemsley's blood pressure was high (155/90 as opposed to resting 110/70 on admission) which could have been explained by her anxiety. He therefore advised her that she should obtain multiple readings during the week at home, if she could obtain a blood pressure machine, or at her local pharmacy and take the results to her GP at the end of the week. If her blood pressure was still high then her antihypertensive medication should be increased.
52. The Registrar checked her radial artery access site and pulse and noted it was satisfactory. He also reviewed her ECG, which was marked as 'routine' performed at 02:00 on the 12 October. At that point in time, and following the review of her chart notes and the handover, he did not suspect a problem.



53. Given that there was no record of any serious complications of the procedure or recommendation for prolonged monitoring or serial cardiac enzymes and because Ms Hemsley did not report any problems, the Registrar felt she was well enough to be discharged.
54. The Registrar states that after he had finished with Ms Hemsley, he moved to another patient in the same room. While attending that patient he heard Ms Hemsley vomiting in the toilet. When he finished with the other patient, he returned to check on her. Ms Hemsley reported that she had suddenly felt nauseated and needed to vomit but otherwise felt fine. She denied any shortness of breath and pain.
55. The Registrar attributed the vomiting to her anxiety and stress over her admission and procedure. He prescribed an anti-emetic medication and recommended that she be kept in the hospital for the next few hours. The Registrar reported that wanted to make sure that her symptoms had improved before discharging her. He did not document this in the medical record and reported that he communicated to the resident doctor and nursing staff that if Ms Hemsley remained nauseated she was to stay as an inpatient. If not, she could go home.
56. The nursing notes indicate that Ms Hemsley was discharged at approximately 10:00 on the morning of the 12 October 2013. The one episode of vomiting had been noted and maxolan given with good effect. There were no complaints of chest pain.

***Ms Hemsley is found deceased in her home***

57. Less than twenty four hours later at about 05:30 on Sunday the 13 October 2013 Ms Hemsley's daughter found her mother apparently deceased in the bath. Ambulance and police attended Ms Hemsley's home
58. Despite advanced resuscitation measures, she was unable to be revived and was pronounced dead at the scene.

**Establishing the cause of death by autopsy**

59. An external and partial examination of the deceased's abdomen and chest was conducted on the 22 October 2013 by Senior Forensic Pathologist, Dr Alex Olumbe. Associated toxicology testing of femoral blood, subclavian blood and urine; a CT scan; and a review of the deceased's medical records was also conducted.
60. Post-mortem CT scan showed haemopericardium with stents inserted in left anterior descending coronary artery and oblique marginal branch of left circumflex coronary artery. There was no aortic dissection. There were no other significant findings.
61. Internal examination confirmed the presence of cardiac tamponade (collection of fluid blood and blood clots) - 250 mls in the fibrous membrane around the heart. It was thought the blood issued from the site where there was recent

stent insertion in the left anterior descending coronary artery. Multiple serial transverse sections of the heart muscle (myocardium) confirmed the presence of an area of haemorrhage in the anterior wall of the left ventricle which could be associated with possible acute infarct, possibly ruptured. There were other remote areas of possible acute myocardial infarction including in the lateral and posterior branches.

62. Histological / microscopic examination of multiple serial sections of left ventricle tissue showed an acute myocardial infarction and transmural rupture of the myocardium. This was the source of the blood that collected in the pericardium.
63. Multiple serial sections of the left anterior descending coronary artery showed a moderate amount of acute haemorrhage in the adjacent epicardial fat but there was no rupture dissection of the vessel or necrosis of the vessel wall.
64. Examination of the coronary arteries showed severe luminal narrowing by atheroma with portions of acute rupture of the plaques in left anterior descending and right coronary arteries. There was no thrombus (blood clot).
65. There was significant natural disease including a moderate amount of emphysema.
66. Dr Olumbe concluded that the deceased suffered from severe triple vessel coronary atherosclerosis including the diagonal branches of the left anterior descending coronary artery and oblique marginal branch of left circumflex coronary artery with variable luminal narrowing from 90% to more than 95%. These were complicated with acute plaque rupture which is an indication of unstable atherosclerosis.
67. There were multiple areas of acute and subacute myocardial infarction which is an indication that she was having ongoing heart attacks for a period of time (hours to several weeks duration). The rupture of the myocardium was consequent to the recent myocardial infarction which was associated with changes of 3 to 4 days after infarction.
68. At autopsy, there was no obvious dissection of the coronary arteries including the sites of the stent placements in the left anterior descending coronary artery (LAD) and oblique marginal branch of left circumflex coronary artery. Clinically, it was indicated that there was a dissection of LAD; this clinical observation could have been a plaque rupture seen on microscopic examination of the sections of the vessel.
69. The presence of a plaque rupture could have exacerbated the extent of myocardial infarction which was ongoing. Dr Olumbe issued a certificate stating that the cause of the deceased's death was:
  - 1 (a) Cardiac tamponade, *due to, or as a consequence of*;
  - 1 (b) Haemopericardium, *due to, or as a consequence of*;
  - 1 (c) Acute ruptured myocardial infarct, *due to, or as a consequence of*;
  - 1 (d) Coronary atherosclerosis (recent stents placement/angioplasty).

### **Open disclosure meeting and next of kin's concerns**

70. On Friday the 25 October 2013, an Open Disclosure meeting was attended by Ms Hemsley's son (Wade) and daughter (Bianca) as well as the Consultant, the Director of Cardiology at the PAH and other relevant internal stakeholders.
71. The Consultant expressed his profound sadness regarding Ms Hemsley's death and went through the angiogram films with the family. He says that he highlighted the occlusion of the small diagonal branch and noted that the diagonal artery which was occluded was 1mm which was far smaller than the 2.25 mm smallest stent that is able to be used.
72. The Consultant says that he explained that this would have caused Ms Hemsley's pain following the procedure and a small heart attack and that they were treating this using medications.
73. During this meeting, the Director of cardiology expressed his view that Ms Hemsley was discharged too early.
74. On the 1 November 2013, Ms Hemsley's son, Wade wrote to the Coroner and confirmed that the Director of Cardiology had commented to him that his mother's discharge was too early however it was likely heart disease which had killed her.
75. Mr Hemsley expressed concerns regarding his mother's early discharge and the lack of information given to families and carers. He said the family had not been informed of the small diagonal artery branch being blocked off, or of risk and occurrence of subsequent heart attack.

### **Issues identified in review by Director of Cardiology at the Princess Alexandra Hospital**

76. The Director of Cardiology raised a number of concerns including:
  - Side branch (diagonal closure) , which is a recognised complication during an angioplasty, was not overtly recognised at the time of original angioplasty , nor documented in the notes nor investigated or managed;
  - Complication of myocardial infarction resulting from stent blocking off side branch artery should have been recognised by consultant, and appropriate monitoring and investigation initiated;
  - Consultant should have recorded specific follow up monitoring and investigation to direct Ms Hemsley's care by staff members following the procedure; and
  - Ms Hemsley was discharged too early following the procedure in the circumstances of a complication.

77. The Director of Cardiology stated that side branch closure with resultant myocardial infarction is a recognised and counselled risk of interventional coronary angioplasty, specifically documented on the consent form as "heart attack" under uncommon risks and complications, occurring approximately 1-5% of cases.
78. He did note however that the side branch in question was "too small" to justify specific intervention to re-open the occlusion and thus the management of this specific complication in Ms Hemsley would entail pain relief, management of ischemia, quantification of the extent of the enzyme rise and an appropriate period of monitoring post event, (most usually 24-48 hours if the enzyme rise was significant).
79. The Director of Cardiology noted that since Ms Hemsley's death, a number of clinical incident reviews of her case had occurred.
80. He said that he informed and discussed with the Consultant the incident and reviewed the angiogram films with him on the 16 October 2013. At his request, an executive meeting was held with the Consultant on 23 October 2013 specifically to discuss issues including post procedure angioplasty care, medical documentation, consultant leadership in enforcing appropriate standards of care, procedure documentation completion and accuracy along with issues of family and staff liaison.

#### **Clinical Forensic Medicine Unit Review provided to Coroners Court of Queensland**

81. Following Ms Hemsley's death, Dr Garry Hall of the Clinical Forensic Medicine Unit provided independent advice on the matter.
82. Dr Hall considered the Registrar caring for Ms Hemsley following the angioplasty missed an opportunity to identify an abnormality in the ECG reading, in particular abnormality in the Q wave. He said that the failure to recognise the Q wave as described by someone as senior as an advanced trainee in cardiology was not reasonable in the circumstances.
83. Dr Hall considered that further investigation with serial cardiac enzyme testing (creatinine kinase and troponin) as well as cardiac monitoring should have occurred.
84. Dr Hall said that the ECG changes indicated that there was likely ischaemia (poor blood flow) involving the anterior aspect of the left ventricle and thus the vascular territory of the LAD coronary artery. As this was the territory where the procedure was being applied (particularly as the cardiologist noted in his subsequent statement that the vessel had possibly dissected) then concern should have been high and enzyme testing conducted.
85. Dr Hall could not be sure that the episodes of chest pain which Ms Hemsley experienced and ECG changes seen on 11 and 12 October 2013 were directly responsible for the area of transmural infarction and subsequent left ventricular rupture leading to the tamponade and death.

86. Dr Hall noted the autopsy findings of disease and multiple areas of heart infarction of differing timelines leading to some degree of uncertainty in temporally attributing the changes to events of the previous day.
87. Given Ms Hemsley's extensive coronary artery disease and multiple areas of myocardial infarction, Dr Hall opined there was significant cardiac morbidity and high risk of mortality in any event.

### **Report by Professor Michael O'Rourke**

88. Expert advice was provided to the Coroners Court of Queensland from Professor Michael O'Rourke regarding the Registrar. Professor Michael O'Rourke, is the Professor of Medicine at the NSW University.
89. In summary, Professor O'Rourke:
  - Opined it was not at all unusual for a patient to have chest pain during coronary angiography and angioplasty, because coronary arteries need to be blocked completely while these are engaged by a balloon which occludes the artery and stretches its wall. He also stated that spasm is not unusual either in a coronary artery or in a radial artery where the catheter is introduced;
  - Professor O'Rourke agreed that Ms Hemsley died as a result of cardiac tamponade due to anterior left ventricular wall rupture in the context of severe coronary artery atherosclerosis but pointed out that the rupture involved a large part of the left ventricular wall and was both anterior and lateral in site;
  - Considered Ms Hemsley should have had a longer period in hospital on both occasions so that healing of the infarct could have been promoted, infarct expansion or rupture prevented, or identified quickly and treated;
  - Strongly disagreed with Dr Hall about the interpretation of ECGs. He said that ECGs taken during the period of September 21 to the 23 September 2013 show a progressive change consistent with extensive anterolateral and inferior myocardial infarction and whose progression included the development of a Q wave in lead A VL and some ST segment elevation. The electrocardiogram (undated) and presumably Friday 11 October 2013 and Saturday the 12 October showed the same pattern of Q wave in lead AVL and some ST segment elevation. This ECG in question showed nothing new compared to that taken two weeks earlier;
  - Strongly disagreed with Dr Hall's comments that the failure to recognise the Q wave was not reasonable. He said that the ECG changes that evolved in the October 11 and 12 ECG were virtually identical to those taken after angioplasty for opening the circumflex coronary artery branch on the 21 September 2013. The Q waves were present in these ECGs and had not changed significantly over the two weeks prior to admission to the PAH for elective angioplasty on the 11 September 2013;

- Advised that cardiac enzymes are not routinely done after an elective procedure. If there is concern about misadventure during coronary angioplasty, it would be desirable to undertake regular post angioplasty measurements of troponin and CK. He said that he believes it would be the responsibility of the proceduralist to arrange for enzyme or troponin assays to be done if elective angioplasty was not completely uneventful. Prof O'Rourke noted that from what he had seen in the notes available to Registrar, he could see no reason for and no benefit as likely to accrue from measurements of CK on Saturday the 12 October 2013 before Ms Hemsley was discharged;
- In circumstances where a request for cardiac enzymes is not documented in the patient's chart, and in circumstances where no complications are documented a first year Registrar should not have been expected to have requested cardiac enzymes; and
- Advised it was reasonable for the Registrar to discharge Ms Hemsley on 12 October 2013.

#### **Improvement actions taken by the Princess Alexandra Hospital**

90. On 11 August 2016, the PAH responded to comments made by Professor O'Rourke.
91. The PAH confirmed that they had amended three key Coronary Clinical Pathways<sup>1</sup> in response to Ms Hemsley's death with a view to preventing similar occurrences in the future. These pathways define the expected course of either an outpatient or an inpatient undergoing Coronary Percutaneous Transluminal Coronary Angioplasty (PTCA). The third applies to inpatients who are undergoing angiogram with or without PTCA.
92. The procedures provide the minimum documentation required by medical, nursing and allied health professionals involved in the patient's care. There is an expectation that further extensive documentation may be required in the inpatient medical chart.
93. The relevant changes to the Clinical Pathways now ensure CK and Troponin testing be undertaken the morning following the procedure if the patient has prolonged chest pain post procedure requiring IV narcotics.
94. The PAH have introduced a number of procedures to the Coronary Care Unit since Ms Hemsley's death:
  - *Chest Pain Management CCU and Ward 3E – February 2014.* The purpose of this procedure to ensure that the CCU/ Cardiology Ward 3E Registered Nurse will accurately assess and promptly manage the treatment of the patient with pain or discomfort due to myocardia ischemia. It aims to minimise myocardial ischaemia, damage and potential for life threatening arrhythmias by decreasing myocardial oxygen demand and enhancing

supply. It sets out the procedure for nursing assessment, management of ischaemic chest pain drug therapy, monitoring of the patient and the documentation of the effects of narcotics. In particular, if there are any changes in the ECG the nurse in charge of the shift and the doctor are to be notified immediately;

- *Coronary Angioplasty – Care of Patient CCU – February 2014.* The purpose of this procedure is to ensure that expert care of a patient undergoing a PTCA is provided to optimise patient safety, prevent complications and allay patient anxiety. It sets out the process for pre and post procedural care. It applies to procedures involving a femoral or arterial approach as well as a TR-Band Deflation procedure. It sets out the minimum observation and documentation requirements. In particular, it requires that prior to discharge all patients are to be reviewed by a Medical Officer and a 12 Lead ECG is to be carried out. The following blood tests need also be carried out. Any patient with a prolonged chest pain requiring IV narcotics is to have a CK taken the next morning at 06:00. The result is to be reviewed by the Interventional Fellow or Cardiology Registrar who is reviewing the patient the same morning;
- *Cardiac Catheter (Angiogram with or without PTCA) Patients Preparation CCU and 3E – August 2015.* The purpose of the procedure is to ensure that patients undergoing cardiac catheterisation receive standardised care. It applies to procedures involving a femoral or arterial approach as well as a TR-Band Deflation procedure. It sets out the requirements for patient preparation and post procedural care including observations and documentation;
- *Nursing Handover – CCU and Ward 3E – January 2015.* This procedure is aimed at promoting the interactive and accurate transfer of patient information from shift to shift. It also ensures the involvement of the patient and their nominated significant other in their care and that the process of conducting nursing handover will incorporate group and bedside exchanges of information. The process of handover is broken down into preparation; information exchange (scrum, bedside handover, safety scan) and patient involvement. It incorporates a step by step hand over flowsheet for each shift (early, late and night duty);
- *Documentation in CCU – January 2015.* The purpose of this procedure is to provide detailed and accurate documentation of specific cardiac acute events occurring in the CCU and to document routine observations. It outlines an expectation that a nursing entry is made in the progress notes each shift for all patients in the CCU and ward 3E. It provides a checklist for all documentation that is required during the patient's stay in CCU; and
- *Admission of Patient to the Coronary Care Unit (CCU) - June 2015.* The purpose of this procedure is to ensure the effective preparation and organisation of admissions to allay patient anxiety and enhance patient safety. It sets out a clear procedure for initial patient assessment,

monitoring outgoing patient assessment, documentation, bed management (during and after hours) as well as transfer of patients from the CCU to cardiology.

95. In their response, the PAH also advised that:

- The Director of Cardiology has spoken to all Consultants about the need for improved handover to receiving Consultants and Registrars and his expectation that any complications during a procedure be carefully documented and handed over with a clear treatment plan in place. This was done at the Mortality & Morbidity Meeting of the Cardiology and Cardiothoracic Department on 20 November 2013 at the PAH and continues to be reinforced by Dr Garrahy at subsequent meetings;
- The Director of Cardiology has implemented a 5pm formal handover meeting for Registrars in the CCU to ensure consistent and thorough medical handover is achieved;
- Medical records at the PAH are now managed in the Integrated Electronic Medical Record (iEMR). ECG results (which are date and time stamped) are now automatically transferred to the iEMR and are available for review by any treating clinician; and
- They have developed new brochures to be provided to patients and their families following coronary angiogram with specific information for patients who have had a radial approach to the procedure.

96. In the PAH's response the Director of Cardiology also addressed a number of the issues raised by Prof O'Rourke as well as other concerns regarding the Consultant Cardiologist who carried out Ms Hemsley's procedure . In particular, he:

- Acknowledged that several of the ECG's in relation to Ms Hemsley which had likely been forwarded to Prof O'Rourke, were incomplete copies e.g. the copy of the ECG on the final day (12 October 2013), had the uppermost edge of the print (which contains the date and time stamp) cropped. The Director considered that the absence of specific date and time marks on the ECG copies in the PDF file may have led to some uncertainty in Professor O'Rourke's reporting of the sequence of these documents. This was particularly in relation to the need for the measurement of enzymes prior to her discharge on the 12October 2013;
- Advised that the ECG's taken on the afternoon of Friday October 11 October 2013 clearly show evidence of myocardial ischemia and these changes, in association with the patient's chest pain signalled the presence of evolving myocardial infarction post angioplasty and should have resulted in the Consultant ordering cardiac enzymes to confirm a complicating myocardial infarction;
- Advised that in the subsequent clinical analysis of Ms Hemsley's death conducted at the PAH, an explanation from the Consultant as to why he did



not perform enzymes following the angioplasty on 11 October 2013 was never obtained. It was for this reason, to act as a "fail safe" in the detection of myocardial infarction post intervention, that a resolution was passed by the consultants in the unit to change the PAH angioplasty clinical pathway to "automatically" check enzymes in any patient who had chest pain requiring the administration of narcotic following angioplasty;

- In respect of Prof O'Rourke's comments that Ms Hemsley should have had a longer period in hospital on her first admission, the Director of Cardiology acknowledged that Ms Hemsley was in hospital for a short period of time. However, he himself had judged the size of the infarct as clinically small. He noted that her condition post infarct was stable, there were no complicating features and a plan had been made for subsequent readmission for elective angioplasty to the LAD artery in October. Furthermore she had been commenced on the specific drugs (beta blockers and ACE inhibitors) which are indicated for the prevention of remodelling and infarct expansion;
- Provided a 10 year analysis of data (2002 to 2012) of patients undergoing myocardial infarction treated with angioplasty at the PAH. It can be seen that over this 10 year period, there has been a progressive shortening of average length of stay for patients with myocardial infarction. He advised that patients are now actively triaged according to the size and complexity of their myocardial infarction, along with the angiographic appearances and the "security" of the angioplasty result;
- Agreed with Prof O'Rourke in his assessment that a "longer period in hospital" on the second hospital admission was absolutely indicated. He stated previously the second hospital admission and the elective Percutaneous Coronary Intervention to LAD was complicated by acute myocardial infarction which for some reason was not overtly recognised, documented or investigated by the Consultant. Had this myocardial infarction been documented and quantified, he said that it was inconceivable that Mrs Hemsley would have been discharged from hospital on the 12 October 2013. He said that given that the subsequent myocardial perforation was very small in size (it was only recognised on the microscopic appearances at post mortem examination) and the rupture occurred within 24 hours of discharge, it is highly likely that had this rupture occurred while she was an inpatient at PAH that she would have become symptomatic with severe chest pain. Had the complication been recognized, there was the possibility she might have survived emergency cardiac surgery.

97. The Director of Cardiology also advised that he disagreed with a number of comments contained in the Consultant's statement and in particular that he:

- Anticipated the procedural complication of diagonal closure prior to Ms Hemsley's angioplasty procedure on the 11 October 2013;

- Recognised the ischaemia in the lab and thought an infarct was inevitable;
  - Recognised the subsequent ischaemia in coronary care but forgot to document the occlusion of the vessel in his report; and
  - Was confident that an infarct was expected that there was no reason to order enzymes post procedure.
98. The coroner observes that there were no contemporaneous notes in the record made by the Consultant of any of these matters. The Director of Cardiology advised that the Consultant is no longer providing angioplasty procedures at the PAH, having voluntarily withdrawn from clinical privileges in this area as from the 12 October 2015.
99. Other professional regulatory bodies are reviewing Ms Hemsley's medical care and considering issues arising.

### **Further correspondence from the Director of Cardiology**

100. On 18 August 2016, the Director of Cardiology was asked to explain what emergency surgery would have been performed had Ms Hemsley been kept in hospital and complications been recognised.
101. On the 29 August 2016, he responded. He reiterated that side branch obstruction during coronary angioplasty is a recognised complication of the angioplasty procedure. It was noted that a number of factors impact on the likelihood of side branch obstruction, particularly the specific anatomy of the ostium of the side branch, and whether the side branch is significantly diseased.
102. The Director of Cardiology said that occlusion of a side branch and resultant consequences depends on the size, both diameter and length of artery, which correlates with the amount of myocardium/muscle supplied by the branch. Side branch occlusion can at times be silent (no pain and no ECG changes), which might indicate that the area of the heart supplied by the branch has already been damaged by myocardial infarction and is scar. Alternatively if the side branch is large, the ischemia can be significant and techniques to either protect against occlusion or rescue (re-opening of the occlusion) are necessary.
103. He said that during the angioplasty procedure, specific note is made of side branches adjacent to the target lesion/vessel. If the side branch is of significant size (e.g. 2mm diameter or greater), the interventional cardiologist will often perform specific interventions to "protect" the side branch and avoid loss of the side branch artery. These interventions usually entail placement of a second guide wire into the side branch to facilitate reopening if occlusion does occur. If a side branch is large (>2.5-3.0mm diameter) bifurcational stenting may be required to preserve the anatomy and patency of the bifurcation with a second (branching trouser-leg) stent arrangement.
104. The Director of Cardiology said that with respect to the specific anatomy of Ms Hemsley, there are two diagonal side branches in relation to the target LAD lesion stented on the 12 October 2013. The first side branch was very small –

1.0 -1.5mm diameter and had as well as an ostial stenosis, some tortuosity of the proximal segment of the first diagonal. It was this branch which occluded, initially following balloon pre-dilatation and then subsequently with stent placement. Flow into the second diagonal (a larger 2.5mm vessel) was not impaired by stent placement.

105. The first diagonal side branch which occluded during the angioplasty was small and given anatomy it comes as no surprise whatsoever to find that this vessel occluded following balloon dilatation and stent placement. The small size however and the ostial anatomy both indicated that any attempt to “preserve or rescue” the branch was likely to be ineffective. The Director of Cardiology said that he found it quite reasonable that the Consultant did not take any special manoeuvres to “preserve this branch”, or to reopen the occlusion of this small branch when the vessel occluded. Under ordinary circumstances loss of such a “small” branch would produce a small myocardial infarction which could be treated medically, without serious long term consequences to function of the heart. Such a myocardial infarction occurs in 1-3% of angioplasty procedures.
106. It was noted that unfortunately the area of the heart territory supplied by this small diagonal branch subsequently underwent necrosis and perforation, resulting in hemopericardium and cardiac tamponade.
107. He said that free wall perforation of the left ventricle following myocardial infarction is a rare complication of myocardial infarction. In circumstances where the infarct has been very large, the perforation rupture typically is large and ragged and the patient’s collapse and subsequent death occurs within minutes.
108. In Ms Hemsley’s case however, the perforation hole which caused hemopericardium, cardiac tamponade and death appears to have been very small. The Director of Cardiology highlighted that on the initial macroscopic post mortem inspection, the pathologist stated “there is no obvious rupture of the myocardium”. However on the subsequent microscopic assessment, a small perforation tract was identified “there is transmural left ventricular rupture” in the area of infarction. i.e. the perforation was very small, not seen by the naked eye, but verified on the microscopic exam.
109. The Director of Cardiology opined that clinically, when cardiac rupture occurs, the passage of blood into the pericardial space causes severe chest pain usually with recurrent ST segment elevation on the ECG. The subsequent accumulation of blood in the pericardial sac causes a lowering of blood pressure, and shock with a clinical syndrome very familiar to interventional cardiology units. These symptoms of pain, recurrent ECG changes and a lowering of blood pressure would have prompted immediate transthoracic echocardiography for a patient under observation in hospital post angioplasty. Given, that in this case, the perforation tract was small, he stated that the pericardial blood would have taken some period of time to accumulate in the pericardial sac: many minutes, rather than instantaneously as in a large perforation.

110. Accordingly, in Ms Hemsley's case it is very likely that this complication would have been diagnosed by echo within 30-60 minutes of her developing recurrent symptoms. At that point, Ms Hemsley would have been resuscitated and taken immediately to the cathlab where the pericardial space would have been drained with pericardiocentesis to stabilise the blood pressure, and she subsequently would have been taken to emergency open heart cardiac surgery with the small perforation over sewn and sealed.
111. The Director of Cardiology said that cardiac perforation post myocardial infarction in the community is an almost invariably fatal complication. He indicated that there are many case reports in the literature of patients (usually already in hospital) who have been diagnosed and rescued with emergency cardiac surgery when this complication is recognised and attended to promptly.
112. Given that the actual size of the perforation in the left ventricular wall was small, the Director suggested that Ms Hemsley could well have been rescued from this fatal complication initially with emergency pericardiocentesis in the cathlab, followed by open sternotomy exposure of the heart and oversewing of the perforation on the anterior surface of the heart.

#### **Improvement actions undertaken by the Cardiology Registrar (Advanced Training)**

113. In his statement, the Registrar advised that that he has participated in multiple activities to analyse the case and receive feedback on his performance. He said that he reviewed the case in detail with the Director of Cardiology. He also discussed the case with the Consultant. He then personally presented the case at the Morbidity & Mortality meeting of the Cardiology and Cardiothoracic Department at PAH on the 20 November, 2013.
114. In attendance were all Cardiology and Cardiothoracic Surgery Consultants and registrars in the department. The feedback generally noted deficiencies in documentation, clinical handover and management of complications. The feedback provided on the Registrar's personal performance was that he should have been more alert and suspicious that something may have been wrong, especially given her episode of vomiting.
115. It was acknowledged that it would have been challenging to piece that together given there was no documentation of the complication, subsequent pain and ECG changes and guidance provided by the Consultant.
116. The Registrar says that since Ms Hemsley's death, he has undertaken two further years of cardiology advanced training. ECG Interpretation is a daily part of the job as a cardiology Registrar hence he considers he has greatly improved his skills in ECG interpretation.
117. He also advised that he now reads and interpret patients' angiograms and procedure images as well as the procedure report prior to discharging patients after all procedures. This was not a skill he had in his first year of training.

118. By viewing and interpreting the coronary angiograms, he says that he is able to notice if there have been any side branch occlusions or other major procedural complications, even if it is missing from the report. He said that Ms Hemsley's death and the outcome were a strong learning experience for him to be especially cautious and suspicious when something does not "smell" right.

### **Improvement actions undertaken by the Consultant Cardiologist**

119. In his statement, the Consultant Cardiologist acknowledged that he should have documented his impressions in the clinical records in more detail on the 11 October 2013 as to the cause of Ms Hemsley's ongoing chest pain and ECGs during post-procedural period.

120. He notes that this would have assisted subsequent doctors in understanding that the infarct was an anticipated procedurally-related event and that the medical management instituted was considered to be appropriate management.

121. The Consultant says that he has been taking great care to document the details of procedures meticulously at every stage and also have been ensuring that he comprehensively hands over his patients to the recovery team.

122. In retrospect, the Consultant considered that having regard to the elevated ECG ST segment levels in Leads 1 and AVL on the evening of the 11 October 2013 and the Saturday morning ECG showing small Q wave in 1 and AVL (neither of which were known to him at the time), and despite Ms Hemsley being stable on Saturday morning, he agrees that she should not have been discharged and should have been monitored for longer.

123. He concurred with Dr Hall that:

- Given the autopsy findings of disease 'and multiple areas of heart infarction of differing timelines of occurrence however lend some degree of uncertainty in temporally attributing the changes to events of the previous day'; and
- Ms Hemsley (given her extensive coronary artery disease and multiple areas of myocardial infarction) 'would have had a guarded future with significant cardiac morbidity and high risk of mortality had she survived.

### **Conclusion**

124. Side branch closure which leads to myocardial infarction is a recognised and counselled risk of interventional coronary angioplasty, specifically documented on the consent form as "heart attack" under uncommon risks and complications occurring in approximately 1-5% of cases.

125. The side branch in question was too small to justify specific intervention to re-open the occlusion and thus the management of this specific complication in Ms Hemsley should have entailed pain relief, management of ischaemia, quantification of the extent of the enzyme rise and an appropriate period of

monitoring post event (most usually 24-48 hours if the enzyme rise was significant).

126. It is not in dispute that Ms Hemsley was discharged from Hospital too soon following her procedure on the 11 October 2013.
127. Given that the subsequent myocardial perforation was very small in size (it was only recognised on the microscopic appearance at the post mortem examination) and the rupture occurred within 24 hours of discharge, it is highly likely that had this rupture occurred while she was an inpatient at the PAH that she would have become symptomatic with severe chest pain. The complication would have been recognised, and possibly, she might have survived emergency cardiac surgery.
128. Such emergency surgery is likely to have included emergency pericardiocentesis in the cathlab, followed by open sternotomy exposure of the heart and oversewing of the perforation on the anterior surface of the heart.
129. The hospital has thoroughly clinically investigated and reviewed the events that occurred from the time of Ms Helmsley's admission on 11 October 2013 and until she was discharged on the 12 of October 2013.
130. The PAH has co-operated with the coronial investigation and responded to underlying issues.
131. The treating clinicians have acknowledged that there were things that they could have done differently and have made improvements to their practice which may prevent similar deaths from occurring in the future.
132. I am satisfied that their conduct is being appropriately considered by appropriate professional and regulatory bodies.
133. The focus of the Coroner's jurisdiction is to reach findings required in section 45 of the *Coroners Act 2003* where possible. There is sufficient information to do so and the findings are as follows:

## Findings

- a) The identity of the deceased is Ms Joanne Hemsley;
- b) Ms Hemsley presented to the Princess Alexandra Hospital on 11 October 2013 for an elective percutaneous stenting of her Left Anterior Descending Artery. She required this procedure due to the almost total blockage of the artery with atheroma narrowing the vessel. The procedure occurred that afternoon. In the course of this procedure an occlusion of the diagonal vessel occurred when the balloon followed by the stent were inserted. This is a known recognisable complication. The consultant cardiologist possibly did not recognise the complication at the time. He did not document the complication in the operation report. Nor was a small dissection of the stented artery recorded. No particular direction or course of treatment was

instructed to staff in the Coronary Care Unit beyond the notation “routine care as per clinical pathway.”

Ms Hemsley was transferred to the Coronary Care Unit in the early evening. The advanced training Cardiology Registrar reviewed Ms Hemsley the following morning on 12 October 2013 between 06:00 and 09:00. He did not observe anything in the patient’s behaviour, or on the record which caused concern. There was no record in the procedure report or in the patient notes of any concerns suggesting the need for Ms Hemsley to have serial cardiac enzymes done or more than routine monitoring for this admission. The Cardiology Registrar advised Ms Hemsley to monitor her blood pressure during the week and see her general practitioner within the week. This was due to her blood pressure being elevated in comparison to the time of her admission.

Just prior to leaving the ward he noted Ms Hemsley had vomited, which he attributed to her anxiety. He checked upon her again and confirmed she did not have any chest pain or shortness of breath. He ordered an anti-emetic and asked staff to monitor her for a few hours prior to her discharge.

Ms Hemsley was discharged at approximately 10:00 on the morning of the 12 October 2013. She died the following morning on 13 October 2013.

Had the complication been documented and assessed Ms Hemsley should not have been discharged on that day. She would have remained in hospital for pain relief, management of ischaemia, quantification of the extent of the enzyme rise and an appropriate period of monitoring post-surgery (most usually 24-48 hours if the enzyme rise was significant). Ms Hemsley certainly received pain relief and the usual care and review of a post procedure cardiac patient, but not the enzyme monitoring and not with the knowledge of the complication that had occurred and the possible associated risk.

At autopsy the subsequent myocardial perforation which led to the transmural left ventricle rupture was noted to be very small in size. It was only recognised on microscopic examination of tissue. The rupture occurred within 24 hours of discharge. . It is highly likely that had this rupture occurred while Ms Hemsley was an inpatient at the PAH that she would have become symptomatic with severe chest pain. Had the complication been recognised, possibly Ms Hemsley might have survived emergency cardiac surgery. This would have involved emergency pericardiocentesis in the cathlab, followed by open sternotomy exposure of the heart and oversewing of the perforation on the anterior surface of the heart.

- c) Ms Hemsley died at approximately 05:30 on the 13 October 2013.
- d) She died at her home, 23 Tamborine Street Loganholme in Queensland;
- e) Ms Hemsley died due to:

- 1 (a) Cardiac tamponade, *due to, or as a consequence of*;
- 1 (b) Haemopericardium, *due to, or as a consequence of*;
- 1 (c) Acute ruptured myocardial infarct, *due to, or as a consequence of*;
- 1 (d) Coronary atherosclerosis treated by recent stents placement/angioplasty-with complications)

134. A copy of the findings is distributed to;

- Ms Hemsley's family;
- The Princess Alexandra Hospital;
- Patient Safety, Department of Health;
- The Royal Australasian College of Physicians;
- The Office Health Ombudsman; and
- Australian Health Practitioners' Regulatory Agency.

135. The findings are also published on the Queensland Coronial website. The dissemination of information in this way is the most appropriate and likely means to raise awareness of such an unexpected death and thus help to prevent a similar death occurring in the future.

### **Request for inquest**

136. I do not consider the differences of opinion by reviewing medical specialists are matters which could lead to any useful recommendation or comment to prevent deaths occurring in similar circumstances.

137. The autopsy has clearly identified the cause of death and reviews of the treating clinicians have acknowledged that there should have been documentation in the clinical records in more detail of the procedures and complications of the procedure on 11 October 2013.

138. The hospital has received the autopsy report and considered the findings. The hospital has co-operated with the coronial investigation and clinically reviewed the events and circumstances surrounding Ms Hemsley's care and treatment.

139. I commend the hospital for the changes they have implemented to their coronary practice since Ms Hemsley's death.

140. In all these circumstances it is not considered in the public interest that an inquest should be convened.

My condolences are extended to Ms Hemsley's family.

Christine Clements  
Brisbane Coroner  
25 October 2016