MAGISTRATES COURT of TASMANIA

CORONIAL DIVISION

IN THE MATTER OF THE *CORONERS ACT* 1995

AND

IN THE MATTER OF AN INQUEST TOUCHING THE DEATH OF ANNE MAREE WOULLEMAN-JARVIS

FINDINGS, RECOMMENDATIONS AND COMMENTS of Coroner Rod Chandler following an inquest held in Hobart on 1,2,14 and 20 February 2017.

Introduction

On 9 July 2015 Mrs Anne Maree Woulleman-Jarvis had a fall at a building site on Hobart's Eastern Shore. Eight days later she died at her home from an undiagnosed subdural haematoma. An inquest into her death has focussed upon her medical management following the fall and in particular upon the failure to diagnose and treat her fatal head injury. These are my findings arising from that inquest.

Background

Mrs Woulleman-Jarvis was aged 62 years. She resided with her husband Robert Jarvis at Fentonbury, a small township sitting adjacent to the Mount Field National Park. She had three sons from a previous relationship, all now adults. The youngest, Matthew, still resided with her and her husband.

Mrs Woulleman-Jarvis had a reasonably extensive medical history including asthma, depression and psoriasis. She also suffered from chronic pain attributable to severe arthritis which was managed with a medication regime put in place by the Chronic Pain Unit at the Royal Hobart Hospital (RHH). She used a walking stick or 4-wheeled walker for stability. Most relevantly she had had heart surgery and was fitted with a metallic aortic valve. As a result Mrs Woulleman-Jarvis took warfarin, a blood thinning medication or anti-coagulant designed to avoid blood clots. Its purpose was to help prevent the formation of blood clots on the metallic valve and to thereby reduce the risk of embolism. Bleeding is a side effect of warfarin and its use requires regular monitoring to ensure that a balance is maintained between preventing clots and causing excessive bleeding. The relevant test is known as International Normalized Ratio (INR) which is a laboratory measurement of the length of time it takes for blood to form a clot. In Mrs Woulleman-Jarvis' case the target INR was within the range of 2.5 to 3.5 seconds.

Events Leading to Death

The circumstances surrounding Mrs Woulleman-Jarvis' death are straightforward and non-controversial. They can be simply stated.

Around midday on 9 July 2015 Mrs Woulleman-Jarvis and her husband attended at a building site in Bellerive intending to collect some timber which had become available following the demolition of some sheds. After opening the gate Mr Jarvis drove their utility vehicle onto the property with his wife following behind on foot. Mr Jarvis parked the vehicle and then heard his wife shout out. He saw her lying on the ground. She had clearly fallen and struck the right side of her head on a bitumen surface. Almost immediately *"a lump and bruising as big as an egg*" appeared above her right eye. It was agreed that Mrs Woulleman-Jarvis should see a doctor. She rang the Salamanca Medical Centre where Dr Juliet Lavers worked. Dr Lavers had been Mrs Woulleman-Jarvis' general practitioner since 2008. Mrs Woulleman-Jarvis was advised that she could be seen immediately.

Dr Lavers saw Mrs Woulleman-Jarvis at 1.50pm. She gave a history of having tripped and fallen. She had abrasions to her right knee, right forehead, right elbow and right little finger.

She stated that there had not been any loss of consciousness. She appeared alert and fully orientated. She did not complain of nausea or headaches. In Dr Lavers' view Mrs Woulleman-Jarvis' presentation did not suggest that she had suffered major head trauma and she therefore did not arrange a CT scan of her brain. Mrs Woulleman-Jarvis was advised to return to the surgery if there was any deterioration in her condition or if she had any concerns. She was in particular reminded of the increased risk of bleeding because of her warfarin therapy. Her most recent INR result was 2.9.

I need to record here that it was the evidence of Mr Jarvis that at the consultation on 9 July Dr Lavers arranged for his wife to have an immediate CT scan of her brain at Calvary Hospital and that a Dr Yong advised them of the results of the scan later that afternoon. I am satisfied that this evidence is incorrect and that the true position is that the scan and the attendance upon Dr Yong occurred on a later date as will become evident as I continue this narrative.

Mr Jarvis reports that in the days following his wife experienced headaches which she self-managed with medication including, at times Endone. In the morning of 14 July the headaches were particularly discomforting. Mrs Woulleman-Jarvis contacted Dr Lavers' rooms and she was advised to attend immediately. She was seen by Dr Lavers at 11.06am. On this occasion Dr Lavers noted Mrs Woulleman-Jarvis to be alert and orientated with no obvious neurological signs or symptoms. She noted a haematoma on her right forehead but recorded a normal cranial examination. However, she was concerned by the complaint of ongoing headaches. She therefore 'phoned Regional Imaging and arranged for an urgent CT scan of the brain. The written request form completed by Dr Lavers describes the reason for the scan in these terms: *"fall few days ago trauma right forehead and zygoma….on warfarin…..headache…..exclude subdural."* At the same time Dr Lavers organised an INR test to check the coagulation status.

Dr Lavers was not working in the afternoon of 14 July as she was leaving the State for a pre-arranged holiday. She therefore organised for the results of the scan and the INR to be forwarded to her colleague, Dr Kim Yong and for him to meet with Mrs Woulleman-Jarvis to report the results and to act upon them as required.

The CT scan of the brain was carried out by a radiographer at Calvary Hospital and was then digitally reviewed by radiologist, Dr Catherine Jones. She did not see Mrs Woulleman-Jarvis in person. After her review Dr Jones completed her medical imaging report which was then dispatched to the Salamanca Medical Centre. In that document she concluded: *"Scalp haematoma overlying the right frontal bone. No skull fracture or intracranial abnormality."* Dr Jones has since acknowledged that this report was incorrect and that she had failed to observe on the imaging a *"7mm small acute extradural hematoma over the convexity of the right superior temporal gyrus, distant to the site of impact."*

Dr Yong saw Mrs Woulleman-Jarvis at 2.09 that afternoon. He advised her that the CT scan was reported to be normal apart from evidence of a sinus infection. Most particularly, there was no reported evidence of bone fractures or intracranial bleed. Despite its urgent request the INR result had not been received. (It was in fact received by the Medical Centre at 4.30pm on 14 July. The reading was 3.6. It seems Mrs Woulleman-Jarvis was not advised of this result and no steps were taken with regard to it. Dr Yong did not consider any

treatment to be necessary. He re-assured Mrs Woulleman-Jarvis and advised her to seek further help if there was any deterioration in her condition.

Mr Jarvis reports that in the evening of 15 July *"Anne was really bad."* Records show that at 9.20pm Health Direct Australia (HDA) was contacted by 'phone. This is an after-hours nurse triage service. A Joanne Williams was informed that Mrs Woulleman-Jarvis had struck her head in a fall a week previously, that she was suffering nausea and a headache and that she had taken panadeine with nil effect. In accord with its protocols HDA transferred the matter to GP Assist Tasmania (GPA) for medical triage. Dr Jeff Ayton was consulting as a triage doctor with GPA at this time. At 9.30pm he spoke to Mrs Woulleman-Jarvis by 'phone. He was informed that she had had a CT scan the previous day but she was not entirely sure of the results. It was his impression that Mrs Woulleman-Jarvis may have been suffering from a serious condition with a potential diagnosis of intracranial bleed secondary to her recent head injury whilst on an anticoagulant. Given her symptoms of nausea and headache along with her location he advised that Mrs Woulleman-Jarvis immediately call an ambulance and go to hospital for re-assessment.

I interpolate at this point to observe that the service provided to Mrs Woulleman-Jarvis, initially by HDA and then by Dr Ayton was, in my opinion, timely, professional and appropriate. It does not warrant any criticism.

Mrs Woulleman-Jarvis acted on Dr Ayton's advice and immediately 'phoned Ambulance Tasmania (AT). It dispatched a vehicle which arrived at the Fentonbury property at 10.10pm. Mrs Woulleman-Jarvis was then conveyed to the RHH arriving at 11.58pm. A paramedic made a written case description, a copy of which was left with the RHH's Emergency Department (ED). It says:

> *'Called to 63-year-old female PT who has developed a headache this evening with associated nausea post a fall onto her head and face 6/7 ago. PT has had a CT scan 24 hours ago at Calvary with nil bleeds noted but PT unsure of results exactly. PT is alert and oriented pink and perfused talkative and interactive with AT. PT has bruising to the right side of face and temporal and frontal and has periorbital bruising. PT is on warfarin. Pt has headaches in frontal region and behind her eyes that is rated at 8/10 but not relieved with IV fentanyl. PT has nausea enroute but nil vomiting noted. It does not appear that pt has improved with management. PT interactive with AT enroute. ALL VSS within normal route limits enroute to RHH for assessment. All neuro obs NAD. PEARL. Pt has taken her own endone this afternoon and panadol forte as well but these did not help headache."*

Mrs Woulleman-Jarvis was administered 10×10mcg doses of Fentanyl en route to the ED according to the AT records.

In the ED Mrs Woulleman-Jarvis was initially attended by a nurse and triaged as a category three patient requiring her to be seen within 30 minutes. The nurse noted: *"feels dizzy, frontal headache, very agitated, nauseous, last INR 2.7 6/7 ago."* That night the registrar-in-charge was Dr Rudesh Prasad. He authorised nursing staff to provide analgesia to Mrs Woulleman-Jarvis and the hospital records show that at 0.20am on 16 July Panadeine Forte

and Nurofen were administered orally followed 20 minutes later by Fentanyl delivered intravenously.

At the time of Mrs Woulleman-Jarvis' presentation Dr Bhavana Mirpuri had been working at the RHH as a medical intern since January 2015. She had had around 5 weeks' experience in the ED. Dr Prasad requested her to take a full history from Mrs Woulleman-Jarvis, to examine her and to then report back to him. Before doing so she read the case description provided by AT along with the notes made by the triage nurse.

Dr Mirpuri saw Mrs Woulleman-Jarvis at 1.10am. She learned of the fall, the use of warfarin and complaints of headaches (rated at 8/10), nausea, vomiting and light-headedness. She learned too that Mrs Woulleman-Jarvis had had a brain scan and that she had been self-medicating with fentanyl, ondansetron, endone and panadeine forte. In the history *"multiple falls"* were noted. On examination she observed Mrs Woulleman-Jarvis to be drowsy but responsive to voice and oriented. Extensive bruising was seen on the right side of the face. Blood tests were ordered (the INR was later reported as 2.7). An online check was made of the CT scan reported upon by Dr Jones and it was noted that there was not any *"skull fracture or intracranial abnormality."* She also noted that nursing staff had recorded that Mrs Woulleman-Jarvis had reported feeling more comfortable after receiving analgesia.

It was Dr Mirpuri's evidence that she then reported to Dr Prasad in these terms:

> *"I would have presented it exactly as I have documented it; as a 62-year-old lady who has presented after a fall; on Warfarin, six days ago, and now presenting with headache. I would have presented the past medical history of her having atrial fibrillation and having a metallic heart valve and I would have informed him that she is on Warfarin refer therapeutic INR and would have given him her social history about where she lived and that she was living with her husband and had some falls and was mobilising with a walker. I would have given him my examination findings and informed him that there was no positive neurological findings and he was aware that there was a CT brain that had already been performed at the private hospital. So, we discussed the report of the CT brain. He then gave me the instructions which I then documented in the plan."*

It was Dr Mirpuri's further evidence that she suggested to Dr Prasad, in light of the history of multiple falls, that Mrs Woulleman-Jarvis be admitted to the short-stay Emergency Medical Unit (EMU) for observation and for assessment later that morning. However, as Mrs Woulleman-Jarvis had reported that her headache and nausea had improved, Dr Prasad proposed that she be discharged home provided that nursing staff was satisfied that she could mobilise independently. According to Dr Mirpuri, Dr Prasad did not consider a repeat CT scan of the brain was required given the report on the scan done previously at Calvary hospital. The discharge was then proceeded with. Dr Mirpuri provided Mrs Woulleman-Jarvis with scripts for Panadeine Forte and ondansetron and advised a follow-up review by Dr Lavers.

It needs to be noted that it was Dr Prasad's evidence that he had no recollection of this conversation with Dr Mirpuri and hence was unable to verify or contradict Dr Mirpuri's account.

Sometime between 3.00am and 4.00am on 16 July Mr Jarvis was phoned by an unknown person at the RHH and advised that his wife was to be discharged and that he should attend to collect her. He resisted saying that he had an appointment in Hobart later that morning and proposed that he collect his wife then. Mr Jarvis was then told that *"they needed the bed and that she had to leave."* He then drove the 1.5 hour trip to the RHH, collected his wife and then took the return trip home. The RHH records show the actual time of Mrs Woulleman-Jarvis' discharge to be 5.35am. They also show, via her Medication Chart that 15 minutes beforehand Mrs Woulleman-Jarvis was provided with a dose of ondansetron, presumably because of ongoing nausea and/or vomiting.

At home Mrs Woulleman-Jarvis spent the day seated in a lounge chair. She had a small amount of soup for her evening meal but nothing more. Her husband had to help her to the toilet. She went to bed at around 10.00pm. Mr Jarvis checked her at around midnight and *"she appeared fine, she was still asleep."* He checked her again at around 4.00am *"and touched her, I did not feel any movement, and I knew she was gone. I checked her breathing and felt nothing."* AT records show that at 4.47am it received a request for an ambulance to attend Mrs Woulleman-Jarvis. It arrived at 5.19am but it was apparent to the attending paramedics that Mrs Woulleman-Jarvis was deceased.

Post Mortem Examination

This was carried out by forensic pathologist, Dr Donald Ritchey. His report includes this description of Mrs Woulleman-Jarvis' head and brain injuries:

> *"The autopsy revealed…….extensive contusion on the right side of the face and forehead where there was a 3cm haematoma. There was extensive bruising of the scalp confined to the right side of the head. There was no calvarian or basal skull fractures however there was a large volume partially clotted soft subdural haematoma overlying the right parietal and temporal cerebral hemispheres producing significant mass effect and leftward deviation of the cranial contents."*

In Dr Ritchey's opinion the cause of Mrs Woulleman-Jarvis' death was a subacute subdural haematoma due to a closed head injury sustained in a fall from standing height. In his further opinion significant contributing factors were a mechanical aortic valve replacement and warfarin anticoagulation.

I accept Dr Ritchey's opinion upon the cause of death.

Issues for Consideration

The circumstances surrounding Mrs Woulleman-Jarvis' death have given rise to a number of issues requiring my consideration. They are:

1. Whether Mrs Woulleman-Jarvis required a CT scan of her brain on the day of her fall?

2. Whether a brain CT carried out on 9 July 2015 would have disclosed any intracranial abnormality?

3. The interpretation of the CT scan taken on 14 July 2015.

4. The adequacy of the treatment and care provided by the RHH to Mrs Woulleman-Jarvis upon her presentation to the ED.

5. Whether the resources of the ED were sufficient to permit it to provide Mrs Woulleman-Jarvis with a proper and adequate standard of medical care?

I will deal with each of these matters in turn.

Need for a CT Scan of the Brain on 9 July 2015.

Mrs Woulleman-Jarvis was aged 62 years. She was taking warfarin because of her metallic aortic valve. She had had a fall and suffered abrasions to her right forehead but without loss of consciousness. These were matters all known to Dr Lavers when she was consulted on 9 July. Nevertheless she did not request a CT scan of the brain. This was because, following her examination, she did not consider that Mrs Woulleman-Jarvis had sustained major head trauma. Dr Mary-Anne Lancaster has been working as a general medical practitioner in Victoria since 1991. She gave opinion evidence upon Dr Lavers' management of Mrs Woulleman-Jarvis. Specific to the care provided on 9 July it was her view that it was; *"All absolutely appropriate. With no loss of consciousness there was unlikely to be any acute issue such as an acute bleed. I would have done exactly the same."*

Dr A J Bell is a specialist intensivist and nephrologist and a former Chief Medical Officer at the RHH. He advises the coroners' office upon medical issues. His opinion on this issue differs from that of Drs Lavers and Lancaster. Instead he expressed the view that it's appropriate for all anticoagulated patients who have suffered minor head trauma to have a CT scan of the brain and this applies, even in those instances where the patient has not experienced a loss of consciousness. This view, he said was based upon the results of separate studies published in Canada and New Orleans. The other evidence pertinent to this issue was a set of Guidelines published by NSW Government Health and entitled, 'Initial Management of Closed Head Injury in Adults', 2nd Ed. That document includes these references:

> At p7 in a section headed 'Indications for CT scan for Mild Head Injury;'
>
> *"Significant head injuries can occur without loss of consciousness or amnesia and that the absence of these features should not be used to determine the need for CT scanning."*
>
> And;

> *"Known coagulopathy and particularly supra-therapeutic anti-coagulation are significant risk factors for intracranial injury and that these patients should have early CT scans and be considered for reversal of anticoagulation."*
>
> At p27 under the title, 'Which Patients with Mild Head Injury Require a CT scan?' the Guidelines identify *"known coagulopathy or bleeding disorder"* as a high risk factor for patients with a mild head injury and recommends that such patients *"should have early CT scanning if available…"*

It was the express evidence of Dr Lancaster that she was unaware of any guidelines recommending the prompt CT scanning of any anti-coagulated patient who suffers a head injury. Although not expressly stated I infer from Dr Lavers' conduct on 9 July and her evidence generally that she was similarly unaware.

I am satisfied upon the evidence that Dr Lavers is an experienced, competent and caring general practitioner who was fully cognisant of the risk posed to Mrs Woulleman-Jarvis by her head injury in the context of her warfarin use. This was reflected by her preparedeness to immediately see Mrs Woulleman-Jarvis and her thoroughness at the consultation including the appropriateness of the advice to her patient. However, was she remiss in not requesting a CT scan contrary to those guidelines to which I have referred?

In my view it would be unreasonable to expect a general practitioner such as Dr Lavers, to be aware of the detail of either those guidelines referred to by Dr Bell or the NSW Guidelines, most particularly their conclusion that an anti-coagulated patient suffering a head injury requries an early scanning even if a loss of consciousness has not occurred. I therefore make no criticism of Dr Lavers for not arranging for Mrs Woulleman-Jarvis to have a CT scan of her brain on 9 July, notwithstanding her anti-coagulation status. Nevertheless, I am mindful of this comment made by Dr Bell in his evidence related to the several guidelines; *"I believe when you put neurological societies and neurosurgeons together in two different countries- invite people worldwide and come up with these opinions based on the evidence then you need to respect those opinions."* I strongly agree with this comment. This leads me to conclude that prudent practice does require compliance by general practitioners with that advice contained in the referenced guidelines, notably that all anti-coagulated persons who suffer a head injury, even without a loss of consciousness, should undergo scanning at the earliest opportunity. For this reason a copy of these findings will be provided to General Practice Tasmania and to the Royal Australian College of General Practitioners with a **recommendation** that they inform their members of the contents of the several guidelines as they relate to the prompt scanning of anti-coagulated patients with a head injury.

Likely Result of a CT Scan of the Brain on 9 July 2015

The question whether a scan carried out on the day of Mrs Woulleman-Jarvis' fall would or would not have revealed an intracranial abnormality was the subject of comment by multiple witnesses. They follow:

1. Dr Philippa Taplin is a radiologist employed in private practice. She described the haematoma identified on the 14 July scan as being *"very small, without significant mass effect."* In her opinion the haematoma would not have been visible from a scan carried out on the day of Mrs Woulleman-Jarvis' fall. She explained; *"Subdural haematomas classically bleed 'slowly,' and are often not apparent on trauma CT brains when these CTs are performed early."*

2. There was evidence in the form of a report from neurosurgeon, Mr Peter Gan. He states that the haemotoma probably would not have been detectable in a scan taken on 9 July as the amount of blood identified on 14 July was *"tiny and small"* and appeared to be relatively fresh suggesting that it had only been there *"for, at the most, three days…."* and was consistent with bleeding having started around 14 July when Mrs Woulleman-Jarvis' headaches became more severe.

3. Professor Dr. Jens Froelich is a professor of interventional and neurointerventional radiology attached to the RHH. In his view the lesion or haematoma evident from the scan on 14 July was small and difficult to see. He was unable to say whether it would have been visible on a scan performed 5 days previously.

4. Forensic pathologist, Dr Ritchey expressed the view that it was unlikely that the haematoma would have been seen on a scan taken on 9 July because they *"tend to grow so slowly."* He further explained; *"The other thing about subdural haematomas is that they start off very small and can be very difficult to see in radiology scans, and that's a problem for patients and it's a problem for doctors as well."*

In my opinion the foregoing makes it clear that in all likelihood a CT scan of Mrs Woulleman-Jarvis' brain carried out on the day of her fall would not have revealed the subdural haematoma which later became evident by scanning carried out 5 days later. This finding inevitably leads to the conclusion that the failure on Dr Lavers' part to request a CT scan when she was consulted by Mrs Woulleman-Jarvis on 9 July was not a factor causative of her death.

The CT Scan of 14 July 2015

I have already recorded Dr Jones' acceptance that her report upon this scan was incorrect in that it did not identify an intracranial haematoma. This concession is compatible with the evidence of Professor Dr Froelich and Dr Taplin, both of whom reviewed the imaging and confirmed that it identified an intracranial haematoma. In their respective reports it is described by Professor Dr Froelich as an *"Acute ~ 6×12 mm diameter right sided fronto-temporal intracranial convex shaped type 1 epidural ('extradural') hematoma"* and by Dr Taplin as a *"Small, acute extra-axial haematoma right temporoparietal region. No significant mass effect."*

I am satisfied upon the evidence that there were factors which militated against the seriousness of Dr Jones' misreporting and provide some explanation for its occurrence. These are:

- The small size of the haematoma making it difficult to see. It's pertinent to observe that Dr Taplin acknowledged that because she was requested to review the scan for the purpose of this inquest that she was alert to the likelihood that she was looking for *"something probably subtle"* and that she may not have detected it if she had viewed the scan in the course of her day-to-day practice.

- Of the approximately 500 images created by the scan only three identified the haematoma.

- The presence of a right frontal scalp haematoma, the underlying area of which Dr Jones may have overly focussed upon relative to other regions of the brain. In her written report Dr Jones advanced this factor as the possible explanation for her failure to observe the intracranial haematoma.

- The work demands upon Dr Jones on 14 July. She described that day as *"extraordinarily busy"* because she and a colleague were required to manage a workload ordinarily undertaken by four radiologists.

Dr Jones' failure to identify the intracranial haematoma on 14 July leads to the question whether this error played a role in bringing about Mrs Woulleman-Jarvis' death. Counsel for Dr Jones has urged me to answer this question in the negative. I am unable to do so.

When Dr Yong was assigned the task of seeing Mrs Woulleman-Jarvis in the afternoon of 14 July he was aware of her referral for a CT scan to exclude an intracranial bleed upon the background of a fall causing head trauma 5 days previously and her use of warfarin made necessary because of her aortic valve replacement. Although he gave no direct evidence upon the matter I have no doubt that Dr Yong, as a qualified medical practitioner, would have appreciated the serious implications for Mrs Woulleman-Jarvis if the CT scan indicated an intracranial bleed and he would have either sought the further advice of Dr Lavers, if she was contactable, or more probably would have acted upon his own initiative. In either event it is in my view certain that Mrs Woulleman-Jarvis would not have been sent home to Fentonbury as did occur but rather would have either been directed to attend the ED at the RHH or alternatively would have been directly referred to a neurosurgeon. If the former option was taken it is also in my view certain that the medical staff in the ED, when made aware of a CT scan showing an intracranial bleed, would have ensured that Mrs Woulleman-Jarvis was referred to the neurosurgical unit. All of this leads me to be satisfied that if the CT scan of 14 July had been accurately interpreted by Dr Jones, Mrs Woulleman-Jarvis would have been placed under the care of a neurosurgeon by the late afternoon or early evening of 14 July 2015. What would then have transpired?

It was the evidence of Professor Dr Froelich that Mrs Woulleman-Jarvis' injury was treatable on 14 July and he would have arranged for her instant neurosurgical review once an intracranial bleed was identified. Similarly, Mr Gan considered the injury to be treatable. The first step was to reverse the anticoagulation. After this surgery to evacuate the blood could have been undertaken, either in the form of a craniotomy or by burr holes. Her likely chance of survival was in the range of 80 to 90%.

In my view the evidence makes it clear that if Mrs Woulleman-Jarvis' intracranial bleed had been identified by the scan on 14 July she would have been promptly referred for neurosurgical management with her injury, most probably, being successfully treated and her death prevented. In other words the first opportunity for Mrs Woulleman-Jarvis' death to have been avoided was lost because of the misreported scan and it is in this context that I consider Dr Jones' conduct to have been a factor which enabled or contributed to death.

The Adequacy of the Treatment and Care Provided by the RHH

It was the unequivocal evidence of Dr Bell that Mrs Woulleman-Jarvis' presentation at the ED mandated a repeat CT scan of the brain, notwithstanding the apparent negative scan reported on by Dr Jones 1.5 days previously. His report states; *"A patient on warfarin is vulnerable to cerebral haemorrhages including subdural haematoma. The exclusion of a subdural haematoma the day before does not exclude that a bleed has occurred today. Changing signs means changing pathology."* In a similar vein it was the evidence of Mr Gan that *"her condition with such severe headaches, she should really have been re-scanned even though she had the scan done two days prior. She certainly should have been kept in hospital for observation and she should never have been sent home."*

Dr Emma Huckerby is a specialist in emergency medicine and the Director of the ED at the RHH, a position which she held at the time of Mrs Woulleman-Jarvis' death. It was her express evidence that Mrs Woulleman-Jarvis was not appropriately treated and that she required a repeat CT scan of the brain which should have been done at around 2.00am after Dr Mirpuri's assessment or later that morning. In the latter instance she should not have been sent home but rather kept in the hospital, ideally in the EMU.

Further, it was the view of Dr Prasad, expressed retrospectively, that: *"If I had known all the information I would have (ordered a CT scan). If it was presented as a – this lady is Warfarinised, has a headache, has had a negative CT scan but is just not settling with industrial strength opiates, that's a kind of a red flag, and I would have scanned."*

In my view the evidence clearly establishes that the level of care provided by the ED was sub-standard. Her complaints of worsening headaches unresponsive to self-administered pain relief, nausea and lightheadedness upon a background of a fall causing head trauma for an anticoagulated patient mandated a repeat CT scan, notwithstanding the previous scan. It also mandated Mrs Woulleman-Jarvis being kept under observation in hospital until the scan was undertaken and the results known.

I am further satisfied that if Mrs Woulleman-Jarvis had a repeat CT scan of her brain on 16 July it would have clearly demonstrated that same haematoma, previously overlooked by Dr Jones. This discovery would have led to Mrs Woulleman-Jarvis being admitted and urgently referred for neurosurgical assessment. In turn it is likely that she would have required that same surgical intervention that Mr Gan indicated would have been appropriate if her haematoma had been detected earlier. Even at this later stage I am satisfied, accepting Mr Gan's further evidence, that Mrs Woulleman-Jarvis' prospects of surviving her injury would have been *"high"* if the correct diagnosis had been made on 16 July 2015.

The foregoing leads to the obvious question; ie. how did it come about that Mrs Woulleman-Jarvis was administered a sub-standard level of treatment that directly facilitated her death? In my opinion there are several factors which provide an explanation. They are:

- Dr Mirpuri's inexperience. She had graduated in 2014 and on 15/16 July was the most junior medical officer in the ED having worked there for just 5 weeks as part of her training on rotation. No criticism is made of the history she obtained or of her examination. However, she made, as Dr Huckerby observed, the *"cognitive error"* of being falsely re-assured by the normal head scan reported by Dr Jones. I am satisfied that this, along with a failure to appreciate that the apparent improvement in Mrs Woulleman-Jarvis' symptoms was attributable to the medication masking the seriousness of her underlying condition, caused her to wrongly focus on the fall history as the most serious aspect of her presentation. I note that it was the fall history which was the basis for Dr Mirpuri's recommendation, made to Dr Prasad, that Mrs Woulleman-Jarvis be kept for observation and not because of a possible brain injury.

- The failure on Dr Prasad's part to direct that Mrs Woulleman-Jarvis have a repeat CT scan. I have set out above Dr Mirpuri's evidence upon the information she provided to Dr Prasad following her examination of Mrs Woulleman-Jarvis including advice of the recent head trauma and her use of warfarin. I accept that this information was in fact relayed to Dr Prasad and it raises the question why it did not cause him to order a repeat scan particularly in light of his experience and seniority within the ED. In my view 'pressure of work' is the very obvious explanation. Later in these findings I comment in more detail upon the staffing structure in place for the night shift on 15 July 2015 and its effect upon the ED's capacity to properly care for its patients. At this point I make the finding that because of the staffing structure in place Dr Prasad was working under significant work pressure and this, in my view, led to him failing to fully digest or process all the information presented to him by Dr Mirpuri. Instead it caused him to adopt, without close analysis, the conclusion of his most junior colleague that the real problem related to Mrs Woulleman-Jarvis' fall history. It was in this context that he authorised her discharge once nursing staff was satisfied that she was able to safely mobilise.
  Before leaving this subject it's relevant for me to observe that Dr Huckerby, when asked to comment on those factors which she considered pertinent to the poor level of care provided by the ED made this comment; *"I think that there is also an error from the perspective that the intern should have been able to be more closely supervised but I believe that it was unreasonable for one registrar to have to supervise so many staff and provide care in that particular environment, especially considering there were up to 15 admitted patients in the emergency department at the time who they would also be responsible for, so I think the workload definitely comes into it."*

The Adequacy of the RHH Resources

A consideration of the capacity of the RHH to provide proper care to Mrs Woulleman-Jarvis requires me first to set out the relevant evidence. Much of it was provided by Dr Huckerby. The evidence shows:

- In accord with the arrangements in place at the time of Mrs Woulleman-Jarvis' death the ED medical staff comprised an Emergency Registrar-in-Advanced Training, namely Dr Prasad, an Emergency Registrar-Junior, a Resident Medical Officer and an intern, namely Dr Mirpuri. Separately there was a consultant in emergency medicine available on-call.

- A night shift at the ED begins at 11.00pm and continues to 8.00am the next day. When the shift began on 15 July the incoming medical staff took over responsibility for 21 patients who were receiving care in the ED and a further 7 patients who were accommodated in the EMU. During the course of the shift a further 35 patients required assessment and treatment.

- For the 12 months to February 2017 the average number of presentations to the ED night shift was 25 patients. This indicates that the 35 presentations on 15 July 2015 represented a 40% increase on the nightly average and was described as a *"a busy night."*

- Documents presented at the inquest and explained by Dr Huckerby show that in the months prior to Mrs Woulleman-Jarvis' death she had very real concerns related to the capacity of her Department to cope with its workload. On 4 March 2015 she had a meeting with Mr Matthew Daly, the RHH's Acting Chief Executive Officer. At that meeting she raised her concerns re, inter alia, ED patient flow and medical staff numbers. On 17 March Dr Huckerby forwarded to Mr Daly and other senior hospital personnel a briefing paper entitled 'Royal Hobart Hospital Emergency Department Medical Staffing.' The expressed aim of that document was to record a comparison of medical staff numbers at the ED of the RHH with staff numbers at four other comparative hospitals in Australia with a view to assessing the adequacy of the staffing levels at the RHH's ED. A summary in the document sets out its conclusions, namely;

    a) *"Current levels of medical staffing at the RHH ED are inadequate with the gap being that of 10 to 15 FTE non-specialist doctors and 3 specialist shifts a week.*

    b) *"This gap in staffing is significantly impacting on the capacity of the ED to provide safe and timely emergency care to patients attending the RHH.*

    c) *"The gap needs to be addressed urgently as current trends in patient attendances and complexity at the RHH (and at all major referral hospitals in Australia) show that ED workload is going to continue to increase."*

- On 21 April Dr Huckerby was requested to provide a formal business case including her proposed strategies. This was done and distributed on 26 August 2015. It

recommended replacing the existing Model of Care with a Team Based Care Model. To facilitate this it recommended; *"….to increase the number of non-specialist medical staff in the RHH ED by the appointment of an additional five FTE registrars, five FTE residents and five FTE interns."* It asserted that such an increase in medical staff would enable a Team Leader to assess and supervise every patient's care, a task that was not possible under the existing Model because it required the senior practitioner to assume a substantial patient load. In her business case Dr Huckerby asserted the existing Model to be *"unsafe"* as it meant *"many patients leave the ED without being reviewed by a senior doctor"* and that it enabled patients suffering a serious illness but *"presenting with features suggestive of a more minor condition (to be) misdiagnosed by the junior medical staff with insufficient experience to recognise the more serious condition."*

- Prior to completion of her business case Dr Huckerby was moved to write to the RHH's Chief Executive Officer (by this time Mr Craig Watson held this position). Her letter is dated 4 June 2015 and she reports; *"The current state of the ED….overcrowding, increasing attendances and staffing that does not comply with national benchmarking…..is causing both potential and actual patient harm. This is unacceptable."* The letter then provides a detailed account of the difficulties faced by the ED and includes this concluding remark; *"The current situation is untenable in terms of the level of risk to our patients, our community, our staff and the organisation."*

- In late 2015 Dr Huckerby learned that approval had been given for the appointment of an additional five registrars and three to five extra interns to the ED. For the ED's night shift this meant that it could be manned by three registrars and a junior doctor, whether it be a resident or an intern. At that time Dr Huckerby considered this a satisfactory outcome.

The foregoing evidence, which I accept, leads me to positively find that in July 2015 the ED's staffing levels did not comply with national bench-marking and exposed patients to the risk of *"actual patient harm."* This is a matter of grave concern, firstly because the RHH's senior management permitted this state of affairs to materialise without an appropriate response and secondly, because it took almost nine months for the situation to be addressed after Dr Huckerby brought it to management's notice in the starkest of terms. Regrettably and tragically Mrs Woulleman-Jarvis was in that nine month period a victim of the *"actual patient harm"* forewarned by Dr Huckerby.

Dr Prasad was still employed as a registrar in the ED in late 2015 when the new staffing structure was put in place. It was his evidence that this enabled him to personally see each of the patients who had been assigned to an intern. He said; *"…..I see every intern's patient, because with more seniors, there's less demand for myself to have my own patient load, which means I can actually float and provide more consultation."* I accept this evidence. It, along with the evidence of Dr Huckerby concerning workload as a factor impacting on Dr Prasad's work performance on 16 July 2015, leads me to conclude that if the new staffing structure had been in place at that date it is likely that Dr Prasad would have had the time to personally examine Mrs Woulleman-Jarvis and to have more closely considered her full

clinical picture. This, I am sure would have led to a decision for a re-scanning to be done which, as previously explained would have led to the intracranial haematoma being detected and life-saving treatment initiated. It thus follows that the staffing insufficiencies in place in the ED on 15/16 July 2015 was a factor causative of death.

Summary

In my opinion Mrs Woulleman-Jarvis was the victim of a cruel trifecta. First, was the failure on Dr Jones' part to identify the intracranial haematoma on the CT scan of 14 July 2015. Second, was the sub-standard level of care provided by the ED. Third, was the medical staff insufficiencies in the ED which adversely impacted upon the Department's capacity to provide its patients with a proper level of care. In my further opinion, Mrs Woulleman-Jarvis' death would, in all likelihood, have been prevented had any one of these factors not arisen.

In accord with s28(1) of the Coroners Act 1995 I make these findings:

a) The identity of the deceased is Anne Maree Woulleman-Jarvis.

b) Death occurred in the circumstances set out in these findings.

c) The cause of Mrs Woulleman-Jarvis' death was a subacute subdural haematoma due to a closed head injury sustained in a fall from standing height.

d) Death occurred on 17 July 2015 at 59 Hall Road in Fentonbury.

Concluding Comments

I extend to Mr Jarvis and to his family my sincere condolences for his wife's death and I trust that this inquest has been of some benefit to all of them in coping with it.

Finally, I wish to record my thanks to counsel-assisting, Ms Allison Shand and to coroner's associate, Ms Katie Luck for their excellent work, both before and during the course of the inquest.

Dated at Hobart this: 17th day of May 2017.

Rod Chandler
Coroner