CORONER'S COURT
OF NEW SOUTH WALES

Inquest:	Inquest into the death of Diane Eastcott
Hearing dates:	7 & 8 April 2022
Date of findings:	6 May 2022
Place of findings:	Coroner's Court of New South Wales at Lidcombe
Findings of:	Magistrate Derek Lee, Deputy State Coroner
Catchwords:	CORONIAL LAW – care and treatment, Ryde Hospital, Macquarie Hospital, Lavender House, concurrent administration of contraindicated medication, verapamil, metoprolol, electronic prescription system, eMeds, pharmacist review, discharge summary, general practitioner follow-up, continuation of prescribed medication
File number:	2018/212947
Representation:	Ms C Xanthos, Coronial Advocate Assisting the Coroner Mr S Barnes for Associate Professor E Barin, instructed by Avant Mutual Mr D Pace for the Eastcott family, instructed by O'Brien Hudson Solicitors Mr R Sergi for Northern Sydney Local Health District, instructed by Crown Solicitor's Office

Findings:

Diane Eastcott died on 10 July 2018 at Macquarie Hospital, North Ryde NSW 2113 where she was an involuntary patient, having been detained in accordance with the *Mental Health Act 2007*.

In the 17 days preceding her death, Diane had been inadvertently prescribed two medications, metoprolol and verapamil, concurrently which was not clinically indicated and which, when taken together, can be dangerous and lead to severe heart block. Whilst the possibility that the concurrent administration of these two medications contributed to Diane's death cannot be entirely excluded, it is more probable than not that the significant coronary artery disease identified at autopsy resulted in Diane's death. The cause of Diane's death was, therefore, ischaemic cardiovascular disease. Diane died of natural causes.

Recommendation

To the Chief Executive, Northern Sydney Local Health District:

I recommend that a review be conducted of the circumstances relating to the re-admission of Diane Eastcott to Macquarie Hospital following her discharge from Ryde Hospital on 28 June 2018 in circumstances where Diane's discharge summary from Ryde Hospital was not sent to, or not received by, Diane's usual general practitioner, in order to ensure that appropriate mechanisms exist to allow for a discharge summary to be received by a discharged patient's general practitioner as intended.

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1. Introduction

1.1 Diane Eastcott was an involuntary patient at a mental health hospital. On 22 June 2018 she suffered an unwitnessed fall and was taken to a general medical hospital where she was found to have an abnormal heart rhythm. During the course of Diane's admission, she was inadvertently prescribed two types of medications which, when taken together, can potentially lead to serious heart problems.

1.2 This error was not recognised resulting in both medications continuing to be prescribed even after Diane was discharged on 28 June 2018 and returned to her usual accommodation. On the morning of 10 July 2018 Diane was found lying in bed unresponsive, and with no signs of life.

2. Why was an inquest held?

2.1 Under the *Coroners Act 2009* (**the Act**) a Coroner has the responsibility to investigate all reportable deaths. This investigation is conducted primarily so that a Coroner can answer questions that they are required to answer pursuant to the Act, namely: the identity of the person who died, when and where they died, and the cause and the manner of that person's death.

2.2 Certain deaths are reportable to a Coroner. Some examples of reportable deaths are where the cause of a person's death is not due to natural causes, or where the cause or manner of person's death may not immediately be known. In Diane's case, two matters were unclear: how the two types of medications came to be prescribed to her erroneously; and whether this concurrent prescription contributed in some way to her death. These matters in turn raised questions regarding the care and treatment provided to Diane at both Ryde Hospital, where she was admitted, and Macquarie Hospital where she returned following her discharge. Both of these hospitals are located within the Northern Sydney Local Health District (**NSLHD**).

2.3 The matters described above are particularly relevant in Diane's case as she had been an involuntary patient at a declared mental health facility for many years. Where the State assumes the care of a person, it is imperative that an independent, transparent enquiry is conducted to ensure that the State discharges its responsibilities in ensuring that the person is appropriately cared for. For all of these reasons, an inquest was required to be held.

2.4 In this context it should be recognised at the outset that the operation of the Act, and the coronial process in general, represents an intrusion by the State into what is usually one of the most traumatic events in the lives of family members who have lost a loved one. At such times, it is reasonably expected that families will want to grieve and attempt to cope with their enormous loss in private. That grieving and loss does not diminish significantly over time. Therefore, it should be acknowledged that the coronial process and an inquest by their very nature unfortunately compels a family to re-live distressing memories several years after the trauma experienced as a result of a death, and to do so in a public forum. This is an entirely uncommon, and usually foreign, experience for families who have lost a loved one.

2.5 It should also be recognised that for deaths which result in an inquest being held, the coronial process is often a lengthy one. The impact that such a process has on family members who have many unanswered questions regarding the circumstances in which a loved one has died cannot be overstated.

2.6 Inquests have a forward-thinking, preventative focus. At the end of many inquests Coroners often exercise a power, provided for by section 82 of the Act, to make recommendations. These recommendations are made to organisations and individuals in order to draw attention to systemic issues that are identified during a coronial investigation, and examined during the course of an inquest. Recommendations in relation to any matter connected with a person's death may be made if a Coroner considers them to be necessary or desirable. Where an inquest is able to identify issues that may potentially adversely impact upon the safety and well-being of the wider community, recommendations are made in the hope that, if implemented after careful consideration, they will reduce the likelihood of other adverse or life-threatening outcomes.

3. Recognition of Diane's life

3.1 Inquests and the coronial process are as much about life as they are about death. A coronial system exists because we, as a community, recognise the fragility of human life and value enormously the preciousness of it. Recognising the impact that a death of a person has, and continues to have, on the family and loved ones of that person can only serve to strengthen the resolve we share as a community to strive to reduce the risk of preventable deaths in the future.

3.2 Understanding the impact that the death of a person has had on their family only comes from knowing something of that person's life and how the loss of that life has affected those who loved that person the most. Therefore, it is extremely important to recognise and acknowledge Diane's life in a brief, but hopefully meaningful, way.

3.3 Diane was born in Wagga Wagga in 1947 to her parents Joyce and Geoff. Tragically, three of Diane's siblings passed away at a young age. However, Diane's parents later had two other children, Tricia and Garry. Tricia describes her older sister as a beautiful child who was so loved.

3.4 In 1959, Diane's family moved to Brighton-le-Sands. Diane was a good student, performing well at school, with many friends and a strong, supportive social network. After leaving school Diane commenced work. However, after approximately 12 months, Diane's family noticed a change in her demeanour – she became anxious about going to work and leaving home on her own.

3.5 Following attempts to seek medical assistance for Diane, she was eventually referred to Gladesville Hospital. Over the subsequent years, Diane was transferred to different facilities, including Rozelle Hospital and Macquarie Hospital.

3.6 Tragically, Diane lost many much-loved members of her family during her life: her mother passed away in 1971, when Diane was only 24 years old; Diane's father passed away in 1995; and Diane's brother, Garry, passed away on 6 May 2018, only some seven weeks before Diane's death.

3.7 It is most distressing to know that Diane experienced such significant loss and separation from her family members for much of her adult life. At the conclusion of the evidence in the inquest, Tricia shared with those in the courtroom some touching and poignant memories of Diane, including memories of having a coffee and chocolate éclair (Diane's favourite treat) with Diane, and simply enjoying the pleasure of her company. There is no doubt that Diane herself was enormously loved and that her sister, Tricia, the sole surviving member of Diane's family, continues to feel Diane's loss most deeply.

4. Diane's medical history[1]

4.1 In 1964, when Diane was 16 years old, she was admitted to Royal Prince Alfred Hospital and treated for depression. Over the subsequent years, Diane had a number of further admissions to the same hospital, for periods of up to two weeks, for treatment of her mental health issues.

4.2 In July 1968, Diane was admitted as a voluntary patient to Gladesville Hospital. She was diagnosed with "*mental retardation with clinical depression*" and was treated with electroconvulsive therapy (**ECT**). During the admission, Diane was noted to be catatonic and refusing all food and drink. On 7 August 1968, Diane was admitted as an involuntary patient under the provisions of the mental health legislation which applied at the time.

4.3 In January 1972, Diane was discharged from Gladesville Hospital and transferred to an aged care facility. However, in March 1972, Diane was readmitted to Gladesville Hospital. Between 1973 and 1978, Diane was admitted to Gladesville Hospital on a number of further occasions, and also spent extended periods of time at St George Hospital and Homebush Convalescent Home.

4.4 In September 1978, Diane was diagnosed with chronic schizophrenia. In the same month, Diane was admitted to North Ryde Psychiatric Centre following a self-harm incident during which she caused a superficial laceration to her left wrist. In the period leading up to 1987, Diane spent further time at a number of accommodation facilities, before being admitted to Macquarie Hospital in 1994. On 1 June 2010, Diane was admitted to the Lavender House at Macquarie Hospital, a unit which generally caters for older patients who have been living with treatment resistant mental illness for many years.

4.5 On 13 July 2017, the Mental Health Review Tribunal (**the Tribunal**) conducted a review of Diane's circumstances as she was an involuntary patient. Diane's treating team at Lavender House indicated to the Tribunal that Diane had been complied with her medication and that her physical health was responding well to pharmacological treatment. It was noted that "*Diane's mental state goes through periods of improvement where her negative symptoms [mainly including amotivation, lack of interest in the ward routine, poor initiation of tasks and impaired executive functioning] become less prominent than usual*". Further, Diane's treating team indicated that she would remain at increased risk of self-neglect, disorganisation, non-compliance with medication, psychotically-driven behaviours and pose a risk to herself and others if discharged from hospital.

[1] This factual background has been drawn from the helpful opening submissions of the Advocate Assisting.

4.6 Accordingly, the Tribunal determined in accordance with section 37 of the *Mental Health Act 2007* that Diane was a mentally ill person and that no other care of a less restrictive kind was appropriate and reasonably available. Accordingly, it was also determined that Diane should continue to be detained as an involuntary patient in a mental health facility for further observation or treatment. Diane was scheduled to be reviewed by the Tribunal again, unless discharged, on or before 12 July 2018.

5. The events of June 2018

5.1 At around 7:30am on 22 June 2018, Diane was found lying on her back in a toilet cubicle at Lavender House after suffering an unwitnessed fall. Nursing staff suspected that Diane may have slipped on water on the floor, causing her left eye and nose area to impact with a sink, resulting in bruising and a small laceration to the bridge of her nose. After being found, Diane was able to sit up by herself and denied any pain. She was also noted to be alert and orientated to person and place. However, at around 8:00am Diane had an episode of vomiting resulting in an ambulance being called at around 9:00am.

5.2 At around 9:50am, Diane was taken to Ryde Hospital by ambulance. Upon arrival at the emergency department (**ED**), Diane was reviewed by Dr Lucy Manuel, junior medical officer (**JMO**), together with Dr Michael Goss, senior ED registrar, at approximately 11:03am. Diane was noted to have obvious left periorbital bruising, but denied a head strike. A routine electrocardiogram (**ECG**) was performed which revealed that Diane was in atrial fibrillation, which had not previously been noted in any of her medical records. Diane was noted to be in sinus rhythm and she denied any chest pain or shortness of breath. Routine blood tests were ordered, and a computed tomography (**CT**) scan of the brain and facial bones was arranged in order to exclude any intracranial haemorrhage or fracture. A decision was made by Dr Manuel and Dr Goss to administer a one-off dose of digoxin[2] 500mg to manage Diane's atrial fibrillation. This was later administered at around 3:07pm. At around 4:40pm, Dr Rao ordered a stat dose metoprolol[3] which was later administered to Diane at 5:02pm.

5.3 Dr Manuel used Diane's medication charts from Macquarie Hospital to record Diane's regular medications whilst at Ryde Hospital, including verapamil[4] 80mg once daily in the morning. In relation to the continuation of verapamil, the medication orders for Diane noted the following:

> **Status:** Still taking, as prescribed; **Information source:** Previous Admission; **Comment:** [History] from Macquarie Hospital (original emphasis)

5.4 Due to Diane's non-specific elevated troponin[5] level, a cardiology consult was arranged to consider the possibility of a non-ST elevation myocardial infarction (**NSTEMI**).[6] Following a discussion at

[2] Medication commonly used to treat abnormal heart rhythms and congestive heart failure.
[3] A beta blocker used to treat hypertension which works by relaxing blood vessels and slowing heart rate to improve blood flow and decrease blood pressure.
[4] A calcium channel blocker used to treat high blood pressure by relaxing blood vessels so that the heart does not have to pump as hard, and slowing electrical in the heart to control heart rate.
[5] Proteins found in the cardiac which are released into the bloodstream when the heart is damaged. Elevated troponin levels may be indictive of a myocardial infarction (heart attack).
[6] A type of myocardial infarction where there is no elevation of the ST segment and which is typically less damaging to the heart.

around 3:00pm with the cardiology registrar (Dr Rao), Dr Manuel charted 300mg of aspirin and 180mg of ticagrelor.[7] Diane was subsequently admitted under the care of Associate Professor Edward Barin, consultant cardiologist, at around 4:29pm.

5.5 In accordance with the orders made by Dr Manuel for Diane's regular medications to continue, verapamil was administered to Diane each morning between 23 June 2018 and 28 June 2018, with the first dose administered at 11:13am on 23 June 2018. Medication records indicate that, following the stat dose of metoprolol given at 5:02pm on 22 June 2018, Diane was given her first charted dose of metoprolol at 8:55am on 25 June 2018 in accordance with orders made by Dr Neelam Singh, JMO. Importantly, this was also the first day that both metoprolol and verapamil were charted concurrently as regular medications for Diane. A comment made by the ward pharmacist in the medication records against the order for metoprolol noted the following (**the Pharmacist's Comment**):

> Order Comment: metoprolol() verapamil(): MAJOR MONITOR CLOSELY: Additive reductions in heart rate, cardiac conduction, and cardiac contractility may occur when calcium channel blockers, especially verapamil and diltiazem, are used concomitantly with beta-blockers.

5.6 For the remainder of her admission at Ryde Hospital, Diane continued to receive two doses of metoprolol and a single dose of verapamil each day between 25 June 2018 and 28 June 2018.

5.7 At around 5:35pm on 28 June 2018 Diane was discharged from Ryde Hospital to return to Lavender House. Dr Verere Bateren, JMO and the on-call duty medical officer, was called to re-admit Diane. Dr Bateren examined Diane and assessed her mobility, and subsequently wrote Diane's medication charts to reflect the medications that had been prescribed to Diane at Ryde Hospital. In essence, this resulted in the continuation of the concurrent administration of both metoprolol and verapamil to Diane daily between 28 June 2018 and 9 July 2018.

5.8 On the morning of 10 July 2018, nursing staff at Lavender House performed a routine morning ward round. At around 6:45am, Diane was found to be lying in bed and not breathing. Resuscitation efforts were immediately initiated and a call was made to emergency services. NSW Ambulance paramedics arrived on scene at around 7:00am and resuscitation efforts were continued. Tragically, Diane could not be revived and was later pronounced life extinct at 7:27am.

6. Postmortem examination

6.1 Diane was later taken to the Department of Forensic Medicine where a postmortem examination was conducted on 13 July 2018 by Dr Sairita Maistry, forensic pathologist. Internal examination revealed the following pathology:

(a) Cardiomegaly;

(b) left ventricular hypertrophy;

[7] Medication uses to lessen the chance of myocardial infarction or stroke in persons with acute coronary syndrome.

(c) significant severe atherosclerosis of the three coronary arteries which supply the heart muscle with blood and oxygen, with sites of critical stenosis of the left anterior descending, letter circumflex and right coronary arteries;

(d) broad areas of ischaemic injury to the myocardium with areas of fibrosis; and

(e) congested lungs with pulmonary oedema, a finding that often accompanies fatal cardiac disease.

6.2 In addition, routine toxicology detected non-toxic concentrations of clozapine, codeine, metoclopramide, metoprolol, paracetamol and verapamil.

6.3 In the autopsy report dated 17 April 2019, Dr Maistry opined that the cause of Diane's death was ischaemic cardiovascular disease.

7. What issues did the inquest examine?

7.1 Prior to the commencement of the inquest a list of issues was circulated amongst the sufficiently interested parties, identifying the scope of the inquest and the issues to be considered. That list identified the following issues:

(1) Whether the care and treatment provided to Diane at Ryde Hospital between 22 and 28 June 2018 was adequate and appropriate?

(2) To what extent, if any, did the concurrent administration of verapamil and metoprolol to Diane contribute to the eventual clinical course?

(3) Whether the care and treatment provided to Diane at Lavender House between 28 June 2018 and 10 July 2018 was adequate and appropriate?

7.2 Each of these issues is discussed in greater detail below. In order to assist with consideration of these issues, opinions were sought from the following independent experts as part of the coronial investigation:

(a) Associate Professor Mark Adams, consultant cardiologist; and

(b) Professor Alison Jones, consultant physician and toxicologist.

7.3 Both Associate Professor Adams and Professor Jones prepared expert reports which were included in the brief of evidence tendered at inquest, and also gave evidence during the hearing.

8. To what extent, if any, did the current administration of verapamil and metoprolol contribute to the eventual clinical course?

8.1 It is convenient to consider this issue first because in order to place the other issues which the inquest examined into context, it is necessary to consider the evidence regarding the possible

causes of Diane's death. Relevant to this consideration is the fact that Diane was inadvertently prescribed verapamil and metoprolol concurrently, at both Ryde Hospital and Macquarie Hospital from 28 June 2018 until 9 July 2018.

8.2 In relation to the concurrent administration of both medications, Associate Professor Adams noted the following:

(a) the doses of both medications (80mg verapamil daily and 25mg metoprolol twice daily) were "*not unusual, and if anything on the lower side*";

(b) the combination of beta-blockers (such as metoprolol) and calcium channel blockers (such as verapamil) has long been recognised in medical literature as a potential problem leading to severe heart block, and is well known by cardiologists;

(c) the concurrent administration of both medications does occur in some instances (where, for example, a single agent is insufficient for heart rate control), but their use for anything other than very short periods can be dangerous as the medications both depress cardiac function and block cardiac electrical conduction;

(d) as the two drugs work synergistically, slowing the clearance/metabolism of each other, this can lead to much higher serum levels than would be achieved with a single drug therapy, causing the adverse effects of the drugs in combination to be much worse over time; and

(e) the concurrent administration of verapamil and metoprolol was not clinically indicated at any stage during Diane's admission to Ryde Hospital as her atrial fibrillation "*was not particularly fast or difficult to slow to require the use of two agents, particularly two that may interact*".

8.3 Overall, Associate Professor Adams drew attention to the difficulty in determining whether the concurrent administration of both drugs had any adverse effect upon Diane, noting that she appeared to be relatively well following her discharge from Ryde Hospital and return to Lavender House. In addition, Associate Professor Adams opined that:

(a) whilst it is possible that the concurrent administration of metoprolol and verapamil played a role in Diane's sudden cardiac death, a definitive conclusion cannot be reached in this regard;

(b) the serum samples of both metoprolol and verapamil were not high and considerably lower when compared to levels seen in cases of toxicity;

(c) the signs of advanced coronary artery disease with areas of ischaemic injury and fibrosis with signs of heart failure identified at autopsy were suggestive of the main cause of death being ischaemic heart disease; and

(d) on balance, it is most likely that metoprolol and verapamil "*did not play a significant role in [Diane's] death*".

8.4 Professor Jones agreed with Associate Professor Adams that whilst metoprolol and verapamil have been deliberately combined in some circumstances where a patient's heart rate is very difficult to control, the concurrent administration of both medications was not clinically indicated at any stage during Diane's admission to Ryde Hospital. In addition, Professor Jones agreed with the opinion expressed by Associate Professor Adams that "*the majority of cardiologists would not combine these medications*".

8.5 Professor Jones similarly noted that the postmortem blood concentrations for both verapamil and metoprolol in Diane's case were within the therapeutic range. Professor Jones also acknowledged the difficulty in determining whether Diane had an adverse event in response to the concurrent administration of these medications on top of her severe ischaemic heart disease, similarly noting that she appeared to have been relatively well on her return to Lavender House.

8.6 Ultimately, whilst acknowledging the possibility that the concurrent administration of verapamil and metoprolol contributed to Diane's sudden cardiac death on 10 July 2018, Professor Jones opined that the most likely cause of Diane's death was ischaemic heart disease.

8.7 Dr Maistry gave evidence that she had considered the reports of both Associate Professor Adams and Professor Jones, and saw no need to amend the autopsy report or the opinion expressed in it as to the cause of Diane's death. Dr Maistry also gave evidence that she preferred not to comment on the clinical opinions expressed by associate Professor Adams and Professor Jones, and that her conclusion from her postmortem investigation was that the cause of Diane's death was ischaemic cardiovascular disease.

8.8 **Conclusions:** The evidence clearly established that there was no clinical indication for metoprolol and verapamil to be administered concurrently to Diane during her admission to Ryde Hospital, or in the period up to 10 July 2018 following her return to Lavender House. This concurrent administration occurred in error, as is discussed in greater detail below.

8.9 Whilst the combination of these two types of medications have long been recognised as causing adverse effects on conduction (which may result in heart block, a very slow heart rate or even cardiac arrest), and depressing cardiac systolic function (which may result in heart failure or cardiogenic shock), there is no clear evidence that such adverse effects were present in Diane's case. This is particularly so given the expert evidence that the doses prescribed to Diane were relatively low, Diane appeared relatively well and showed no signs of any adverse effects following her return to Lavender House, and the concentrations of metoprolol and verapamil detected in serum samples were considerably lower than adverse outcomes involving toxicity described in academic literature.

8.10 Both Associate Professor Adams and Professor Jones acknowledged that the possibility of the concurrent administration of metoprolol and verapamil contributing to Diane's death could not be entirely excluded. However, both experts opined, having regard to the significant cardiac pathology identified at autopsy, that it was most likely that the medications did not play a significant role in Diane's death, and the most likely cause of her death was ischaemic heart disease. Having regard to these opinions, as well as to the opinion expressed by Dr Maistry, it is more probable than not that the cause of Diane's death was ischaemic cardiovascular disease. Therefore, on balance, Diane died of natural causes.

9. Was Diane provided with adequate care and treatment at Ryde Hospital?

9.1 Consideration of this issue requires examination of the circumstances in which verapamil and metoprolol came to be administered concurrently to Diane, and whether any investigation and follow-up from a cardiology perspective was warranted based upon Diane's initial presentation to Ryde Hospital.

Medication prescription

9.2 Upon Diane's presentation to the Ryde Hospital ED on 22 June 2018, Dr Manuel recorded Diane's regular medications as per her medication chart from Macquarie Hospital. Dr Manuel explained that it was typical for patients transferred from an external facility to present to the ED with a copy of their current medication chart. However, Dr Manuel gave evidence that she could not recall how she obtained Diane's medication history or whether Diane's medication charts from Macquarie Hospital (if they arrived with her) were handwritten. Dr Manuel's continuation of Diane's regular medications meant that verapamil continued to be administered to Diane, with the first dose given at 11:13am on 23 June 2018.

9.3 Following the stat dose of metoprolol given to Diane at 5:02pm on 22 June 2018, she was reviewed by Dr Singh on the morning of 25 June 2018. The progress notes (authored at 8:57am) indicate that Diane was noted to be feeling well, with nil chest pain or shortness of breath. The progress notes also record a plan for Diane to be commenced on metoprolol with the following noted: "*Will Discuss with Dr Barin – for further plan*". The plan documented by Dr Singh is reflected in the medication records which note that the order for metoprolol was given at 8:55am, and the first dose administered to Diane at 8:58am.

9.4 Associate Professor Barin gave evidence that it was not his general role to manage the day-to-day care of a patient; rather, his role was to advise the treating team regarding a patient's care. In this regard, Associate Professor Barin gave evidence that it was his usual practice to confer with the treating team on a daily basis to discuss the care of a patient.

9.5 Associate Professor Barin prepared two letters prior to the commencement of the inquest in which he addressed aspects of Diane's care and treatment. In his first letter dated 19 February 2020, Associate Professor Barin stated that Diane was commenced on digoxin and metoprolol for heart rate and rhythm control and that her "*usual verapamil was withdrawn as ineffective*". In his second statement dated 29 March 2022, Associate Professor Barin stated that he could not recall

the nature of any conversation with clinical staff regarding the cessation of verapamil, when such instructions might have been given (although it was likely at the time of Diane's diagnosis of atrial fibrillation), and to whom such instructions might have been given (although it was likely to have been given to the JMO in the ED or the cardiology registrar). Associate Professor Barin also acknowledged that he could not locate any contemporaneous record regarding an instruction to withdraw verapamil, noting that it was not his usual practice to document discussions with a treating team.

9.6 In evidence, Associate Professor Barin expanded upon the matters referred to in his two statements in two important respects:

(a) first, he acknowledged that his reference to verapamil being withdrawn as ineffective was a general recommendation made for this type of medication, and that he was relying upon his usual practice when making this statement; and

(b) second, he acknowledged the possibility that he forgot to give instructions to any clinical staff for verapamil to be withdrawn from the medications to be administered to Diane.

9.7 When asked about the progress note entry made by Dr Singh on the morning of 25 June 2018, Associate Professor Barin gave evidence that the decision to commence Diane on metoprolol would not have been discussed with him prior to the medication actually being administered. Instead, Associate Professor Barin gave evidence that it would have been usual for the treating team to discuss this aspect of Diane's management with him some time after 9:00am on 25 June 2018. However, Associate Professor Barin gave evidence that he had no recollection of any such discussion occurring, and that if indeed such a discussion had occurred, he also had no recollection of being aware that Diane had been prescribed verapamil and metoprolol concurrently.

9.8 Further, Associate Professor Barin gave evidence that at no stage did he see the Pharmacist's Comment and that it was not brought to his attention by any clinical staff. Upon Diane's discharge on 28 June 2018, Associate Professor Barin gave evidence that he could not recall whether he reviewed Diane's electronic medication record but acknowledged that he "*missed*" the fact that Diane had been prescribed verapamil and metoprolol concurrently. In this regard, it should be noted that the discharge summary prepared by Dr Singh recorded both metoprolol and verapamil as being amongst the medications being taken by Diane upon discharge.

9.9 Dr Darlene Mathen, Director of Medical Services at Ryde Hospital, provided a statement to the inquest in which she explained that as at June 2018 a patient's medications were reviewed by medical staff from the admitting team on weekdays as part of daily patient review, and reviewed by nursing staff on a daily basis as a routine aspect of medication administration. In addition, as at June 2018, a ward pharmacist was allocated to each ward and was available to review medication charts on weekdays.

9.10 Dr Mathen also explained that as at June 2018 and electronic medication prescribing system (**eMeds**) was in place at Ryde Hospital. When a medication is ordered, an automatic pop-up alert

will appear in eMeds to flag medication contraindications or other prescribing problems. However, these alerts are not recorded on the eMeds medication chart and cannot be reviewed retrospectively.

9.11 As to the Pharmacist's Comment, Dr Mathen explained that this was a manual annotation to Diane's medical record. Dr Mathen gave evidence that the usual practice, following such an annotation, would be for the pharmacist to contact the prescribing doctor to discuss the issue that had been identified. Opportunities for such a discussion would have been available during the morning multidisciplinary ward round, and throughout the course of a day given that a pharmacist was allocated to each ward and had opportunities to interact with treating teams. Dr Mathen explained that as at June 2018 such discussions were not routinely recorded in a patient's electronic medical record. However, Dr Mathen further explained that the documentation of discussions between pharmacist and treating teams has improved since 2018, with these interactions now routinely documented in a patient's electronic medical record.

9.12 Dr Mathen gave evidence that this type of documentation is not governed by any standard operating procedure, practice guideline or similar document. Rather, it is a practice that has developed and evolved as part of both orientation and training provided to staff, and is routinely monitored via regular file reviews and audits as part of the medication safety review process for patients.

9.13 **Conclusions:** The clinical progress notes provide no indication as to whether any member of Diane's treating team gave consideration to the fact that she had been prescribed metoprolol and verapamil concurrently. Further, because any discussions between the treating team and Associate Professor Barin were not documented it is also unclear whether the concurrent prescription of these two medications was discussed. As a result, it is not entirely clear whether there was an instruction given by Associate Professor Barin to cease verapamil, which was not followed, or whether Associate Professor Barin simply omitted to provide such an instruction. However, it is most likely that the latter occurred given the concessions made by Associate Professor Barin in evidence that the decision to withdraw verapamil referred to in his first statement reflected his general practice rather than a specific step taken in Diane's management, and that it was possible he had forgotten to provide an instruction to withdraw the verapamil. In addition, Associate Professor Barin acknowledged that he had also not recognised that Diane had been prescribed both verapamil and metoprolol upon her discharge.

9.14 As medication alerts on eMeds cannot be reviewed retrospectively, there is no direct evidence that such an alert appeared at the time that metoprolol was prescribed to Diane on 25 June 2018. However, there is also no evidence that the alert system did not function in the usual manner on this day. Notwithstanding, it is clear that if such an alert appeared and was seen by a member of the medical or nursing staff, no action was taken to address the concurrent prescription of verapamil and metoprolol to Diane.

9.15 Similarly, although the Pharmacist's Comment is clearly documented on Diane's electronic medical record, there is no evidence of any action being taken in relation to this, or any evidence of a discussion having occurred between a pharmacist and a member of Diane's treating team regarding it. Again, it is clear that despite the Pharmacist's Comment verapamil and metoprolol continued to be administered to Diane.

9.16 Having regard to the absence of any clinical indication for verapamil and metoprolol to be administered to Diane concurrently, this aspect of the care and treatment provided to Diane at Ryde Hospital was neither adequate nor appropriate.

9.17 However, it is important to note that since June 2018, it is now routine practice at Ryde Hospital for discussions between a pharmacist and a member of a patient's treating team to be documented in that patient's electronic medical record. Whilst this process relies upon a pharmacist initiating such a discussion, the evidence from Dr Mathen establishes that the process is monitored through regular patient file reviews and audits to ensure that it is being followed as intended.

9.18 Counsel for the Eastcott family submitted that a number of recommendations ought to be made to the NSLHD regarding the issue of a specific memorandum or work order which provides for staff who prescribe and administer medication to patients to check eMeds for any alerts regarding contraindications or prescribing problems, prior to the prescription and administration of such medication. It was also submitted by counsel for the Eastcott family that any consultation between a pharmacist and a medical officer should be documented in a patient's clinical progress notes.

9.19 So far as the second of these proposed recommendations is concerned, the evidence establishes that a practice currently already exists for discussions between a pharmacist and a member of a patient's treating team regarding potential medication contraindications to be documented in the patient's electronic medical record. Further, so far as the first of the proposed recommendations is concerned, the inquest received no evidence of the practices regarding prescription and administration of medication at other hospitals within the NSLHD, including major tertiary referral hospital such as Royal North Shore Hospital. In such circumstances, it is not possible to gauge the potential effect of such a broad recommendation of the type proposed on workforce resources, which may in turn have adverse consequences for clinical care and patient safety. Accordingly, it is neither necessary nor desirable to make the recommendations proposed.

Investigation of cardiac pathology

9.20 Associate Professor Adams noted that on Diane's admission to Ryde Hospital there was always the possibility that she had asymptomatic coronary artery disease, which was in fact ultimately demonstrated at autopsy. Notably, Diane had a number of risk factors for coronary artery disease including dyslipidaemia, hypertension, obesity and being 70 years of age. However, in the absence of chest pain or other cardiac symptoms, Associate Professor Adams considered that no further action was required other than ensuring optimal medical therapy. In this regard, Associate Professor Adams expressed the following views:

(a) Diane was already on good treatment with blood pressure control, and had been prescribed medications for her dyslipidaemia and impaired glucose tolerance, with aspirin added to her medication regime during her admission at Ryde Hospital;

(b) Diane's existing treatment regime was appropriate based on her risk factors;

(c) it was appropriate not to undertake further investigations of Diane's coronary arteries with invasive coronary angiography, given that the use criteria current as at June 2018 for angiography lists the investigation of atrial fibrillation with angiography as inappropriate, and its use in type 2 NSTEMI as not known;

(d) even if angiography have been undertaken, and shown disease in all three coronary arteries, an approach of optimal medical therapy would have been undertaken in the absence of other symptoms; and

(e) an alternative to optimal medical therapy may have been coronary artery bypass surgery, which would not have been low risk given Diane's body habitus.

9.21 One matter which arose during the course of the inquest was whether appropriate consideration was given to Diane's capacity to accurately describe any symptoms that she was experiencing to her treating team, and whether any difficulty on Diane's part in doing so may have affected the treatment provided to her. These questions were raised primarily due to two entries in the progress notes:

(a) on 25 June 2018, the following was recorded by a physiotherapist regarding a history provided by Diane: "*…Information from sister who also reported that [Diane] may not cooperative [sic] with staff. Better to see [patient] with sister present*"; and

(b) on 27 June 2018, the following was recorded by Dr Rao: "*However note that [Diane] may have difficulty expressing pain or giving a history around the fall*"; and

9.22 With regards to the above, the following additional entries from the progress notes should be noted:

(a) A nursing note entry at 5:39pm on 22 June 2018 recorded that Diane was able to speak in full sentences and denied any chest pain;

(b) A nursing note entry at 6:13pm on 25 June 2018 recorded that Diane was complaining of right leg pain;

(c) Two nursing note entries at 5:49am and 8:55pm on 26 June 2018 recorded that Diane had nil complaints of pain or discomfort;

(d) On 26 June 2018, an attempt was made to see Diane with Tricia for the purposes of a physiotherapy appointment at 3:00pm. However, by 3:25pm Tricia had not arrived at the

hospital and the physiotherapist had to leave in order to attend to another appointment at 3:30pm;

(e) A nursing note entry at 12:15pm on 27 June 2018 recorded that Diane was voicing "*knee/behind knee pain as well as front bone pain*";

(f) The entry made by Dr Rao on 27 June 2018 described above goes on to note the following: "*… discussion with family (Tricia) this [morning] who noted that Diane expressed to her some degree of pain on her RIGHT thigh and hip*"; and

(g) Two nursing note entries at 10:35am and 5:45pm on 28 June 2018 recorded that Diane had nil complaints of pain whilst mobilising.

9.23 In evidence, Associate Professor Adams was asked whether Diane's mildly elevated troponin levels together with a possible complaint of chest pain might have warranted any intervention. Associate Professor Adams explained that consideration might have been given for an angiogram to be performed with such a presentation, but noted that it would be more appropriate to consider a non-invasive investigation such as a stress test or stress echocardiogram.

9.24 Overall, Associate Professor Adams opined that the non-diagnostic ECG changes, the finding of normal left ventricular function on echocardiography and the absence of any evidence of chest pain meant that it was reasonable to attribute Diane's troponin rise to the episode of atrial fibrillation. Associate Professor Adams also expressed the view that it was appropriate for Diane to be discharged from Ryde Hospital on 28 June 2018 without further interventions, given that her atrial fibrillation was controlled, she was haemodynamically stable, she had been stabilised on medications, and her troponin level had virtually returned to baseline.

9.25 **Conclusions: The** available evidence indicates that during Diane's admission at Ryde Hospital, no further intervention was warranted to investigate the possibility that she was suffering from asymptomatic coronary artery disease. Relevantly, Associate Professor Adams explained that there are number of different causes of atrial fibrillation, but coronary artery disease is not one of them, although both conditions frequently coexist because of common risks factors. Further, Associate Professor Adams explained that workup for coronary artery disease would not be regular treatment for a patient presenting with atrial fibrillation. Rather, it would be more important to look at the patient's cardiac function with an ECG and investigate possible electrolyte imbalance.

9.26 It should be noted that there is no evidence that Diane was experiencing any chest pain during her admission which she was unable to describe to those treating her. Indeed, there are entries in the progress notes which record that Diane complained of pain on a number of different occasions, and similarly denied experiencing any pain, including chest pain, on other occasions. In addition, it is evident that there were occasions where attempts were made by medical and allied health staff to speak with Diane with Tricia present, although this could not always occur. Overall, it could not be said that the care and treatment provided to Diane regarding investigation of her initial presenting cardiac pathology was inadequate or inappropriate.

9.27 Counsel for the Eastcott family submitted that a number of recommendations should be made arising from aspects of Diane's care and treatment at Ryde Hospital. These proposed recommendations focused largely on involving family members of a patient in the process of taking a history from a patient, and in general communication between a patient and members of the patient's treating team. The proposed recommendations were far-reaching and broad in scope and it was unclear whether they were purported to be directed towards NSLHD or to NSW Health, more broadly. Regardless, as noted above, it is evident that the evidence in this case did not identify a basis for such broad recommendations to be made, in circumstances where no evidence was adduced at inquest as to any existing NSW Health Policy Directives or NSLHD Clinical Guidelines and/or Policies and Procedures which may already address these issues. In the circumstances it is neither necessary nor desirable to make the recommendations proposed.

10. Was Diane provided with adequate care and treatment upon her return to Lavender House?

10.1 Again, two matters are relevant to consideration of this issue: the continuation of Diane's medication regime from Ryde Hospital upon her return to Macquarie Hospital; and whether appropriate follow-up was required or conducted having regard to Diane's discharge summary.

Continuation of medication regime

10.2 Dr Bateren gave evidence that as the on-call duty medical officer called to re-admit Diane to Lavender House on 28 June 2018, it was her role to assess Diane, read the discharge summary from Ryde Hospital, document the medications that Diane was on, address any urgent issues and provide a handover to ward staff. Relevantly, Dr Bateren explained that she copied from the discharge summary the medications that had been prescribed to Diane at Ryde Hospital. As the discharge summary listed both metoprolol and verapamil, this had the effect of continuing the concurrent administration of these medications from 28 June 2018 until 9 July 2018. Dr Bateren explained that as at June 2018 both of these medications were outside her expertise and scope of practice.

10.3 Dr Tom Vandeleur, Medical Superintendent at Macquarie Hospital, provided a statement to the inquest which explained the following:

(a) as at June 2018, upon a patient's return to Macquarie Hospital following an admission to Ryde Hospital it was usual practice for a registrar to chart new medications based on the medications from the patient's discharge summary (and, if provided, a copy of the medication charts from Ryde Hospital);

(b) as at June 2018, pharmacy staff would then review the new medication chart as soon as practicable, typically on a weekly basis;

(c) if a patient was referred to the Macquarie Hospital General Practitioner Clinic, a GP or general medical doctor would also review the medication regime;

(d) following the introduction of eMeds at Macquarie Hospital in mid-2019, when a patient is returned to Macquarie Hospital from Ryde Hospital, their new medication chart is reviewed in real-time by one of the Macquarie Hospital pharmacists; and

(e) medication contraindications or other prescribing problems are flagged automatically via automatic pop-up alerts created by eMeds.

10.4 **Conclusions:** The continuation of medication prescribed to Diane at Ryde Hospital upon her return to Macquarie Hospital was done in accordance with the usual practice for any patient being re-admitted. However, as the inadvertent concurrent administration of metoprolol and verapamil had not been identified at Ryde Hospital, this led to the continued administration of both medications between 28 June 2018 and 9 July 2018.

10.5 Importantly, the introduction of eMeds at Macquarie Hospital has mitigated the risk of inadvertent continuation of medication which is contraindicated upon a patient's return from Ryde Hospital. The evidence establishes that in the process of generating a new medication chart upon a patient's return, the patient's existing medication regime is reviewed in real-time by a pharmacist, and that hospital staff are automatically alerted to any prescribing concerns.

Discharge summary and follow up

10.6 The discharge summary authored by Dr Singh at Macquarie Hospital on 27 June 2018 was addressed to Dr John Galicek, Diane's treating GP at Macquarie Hospital. As part of the discharge plan, it recommended: "*Followup [sic] with own cardiologist for ongoing care*".

10.7 Dr Bateren gave evidence that upon reviewing the discharge summary when re-admitting Diane to Macquarie Hospital, she had an expectation that Diane's treating team would follow up regarding the discharge plan and refer Diane to her GP. Dr Bateren explained that in the usual course, the nursing team would hand over to the treating team on the morning of 29 June 2018 and therefore assumed that the treating team would arrange for follow-up "*in a day or so*".

10.8 Dr Galicek provided a letter to the inquest in which he indicated that he had been involved in Diane's medical care since the 1990s in his capacity as a Visiting Medical Officer GP at Macquarie Hospital. Dr Galicek indicated that he did not receive a copy of the discharge summary from Ryde Hospital, and was not requested to see Diane following her admission.

10.9 Dr Mathen gave evidence that Diane's discharge summary from Ryde Hospital would have automatically been sent to Dr Galicek's address which already existed in the electronic records system. On this basis, Dr Mathen was unable to explain why the discharge summary was not received by Dr Galicek.

10.10 Notwithstanding the above, Associate Professor Adams opined that Diane's cardiovascular condition was appropriately managed at Lavender House between 28 June 2018 and 10 July 2018. Associate Professor Adams gave evidence that he did not consider that any symptoms (such as nausea, diarrhoea and vomiting) which Diane exhibited upon her return to Lavender House

warranted referral to a cardiologist, but may have resulted in referral to a GP for investigation of a gastrointestinal infection, side effects from medication or some other cause. Overall, Associate Professor Adams expressed the following view:

> […] I do not think that the cardiovascular events that occurred within two weeks of discharge could have been foreseen. Certainly [Diane] had a number of vascular risk factors, and although these were appropriately controlled there was still a risk of vascular disease. In addition, it is well recognised that severe mental health disorders are an independent risk factor for coronary disease. As a result, it was always a distinct possibility that [Diane] might have an acute coronary event, and that this might be fatal. However, I do not think that whether or when this might occur was predictable, even if a coronary disease had been investigated more aggressively.

10.11 **Conclusion:** It is evident that Dr Galicek did not receive a copy of Diane's discharge summary from Ryde Hospital. The reason for this is unclear on the available evidence. What is clear, though, is that no follow-up, of a cardiology nature or otherwise, was arranged following Diane's return to Lavender House.

10.12 Despite the above, the expert evidence establishes that a referral to a cardiologist was not necessarily warranted having regard to the treatment provided to Diane at Ryde Hospital and her capacity to be discharged on 28 June 2018. In addition, even if a referral had occurred and resulted in further investigations, it is unlikely that such investigations could have predicted the tragic events of 10 July 2018.

10.13 However, it is plain that a discharge summary from a hospital is intended to convey important information to a patient's usual treatment providers. Although there is no evidence in this case that the conveyance of such information would have prevented the eventual outcome, such information may well be more critical in a different scenario. It is therefore important that the mechanisms by which this information is conveyed are appropriately robust and reliable. In circumstances where, on the presently available evidence, there is no clear understanding regarding what factors may have contributed to Diane's discharge summary not being conveyed to Dr Galicek as expected, it is desirable to make the following recommendation.

10.14 **Recommendation:** I recommend to the Chief Executive, Northern Sydney Local Health District that a review be conducted of the circumstances relating to the re-admission of Diane Eastcott to Macquarie Hospital following her discharge from Ryde Hospital on 28 June 2018 in circumstances where Diane's discharge summary from Ryde Hospital was not sent to, or not received by, Diane's usual general practitioner, in order to ensure that appropriate mechanisms exist to allow for a discharge summary to be received by a discharged patient's general practitioner as intended.

11. Findings pursuant to section 81 of the *Coroners Act 2009*

11.1 Before turning to the findings that I am required to make, I would like to acknowledge, and express my gratitude to Ms Tina Xanthos, Coronial Advocate Assisting for her excellent assistance throughout the coronial process, and for approaching the matter in a sensitive and compassionate manner.

11.2 I also thank Leading Senior Constable Mark Stephenson for conducting the police investigation and compiling the initial brief of evidence.

11.3 The findings I make under section 81(1) of the Act are:

Identity

The person who died was Diane Eastcott.

Date of death

Diane died on 10 July 2018.

Place of death

Diane died at Macquarie Hospital, North Ryde NSW 2113 where she was an involuntary patient, having been detained in accordance with the *Mental Health Act 2007*.

Cause of death

In the 17 days preceding her death, Diane had been inadvertently prescribed two medications, metoprolol and verapamil, concurrently which was not clinically indicated and which, when taken together, can be dangerous and lead to severe heart block. Whilst the possibility that the concurrent administration of these two medications contributed to Diane's death cannot be entirely excluded, it is more probable than not that the significant coronary artery disease identified at autopsy resulted in Diane's death. The cause of Diane's death was, therefore, ischaemic cardiovascular disease.

Manner of death

Diane died of natural causes.

12. Epilogue

12.1 On behalf of the Coroner's Court of New South Wales and the Assisting Team, I offer my deepest sympathies, and most sincere and respectful condolences to Tricia, and to Diane's loved ones and friends for her most painful and devastating loss.

12.2 I close this inquest.

Magistrate Derek Lee
Deputy State Coroner
6 May 2022
Coroner's Court of New South Wales