

CORONER'S COURT OF THE AUSTRALIAN CAPITAL TERRITORY

Case Title:	Inquest into the Death of Patricia (Jill) Croxon
Citation:	[2023] ACTCD 3
Decision Date:	15 February 2023
Before:	Coroner Archer
Decision:	See [9], [38],[40], [44], [48], [52].
Catchwords:	CORONIAL LAW – cause and manner of death – medication administered in the wrong form - incompatible medications - no criticism of treating clinicians – matters of public safety addressed by systemic changes to prescription and administration practices - delay in coronial proceedings
Legislation Cited:	<i>Coroners Act 1997</i> (ACT), s 3BA, s 13, s 34
Representation:	Counsel Assisting Ms S Baker-Goldsmith Counsel for the Australian Capital Territory Ms K Musgrove, instructed by the ACT Government Solicitor Solicitor for Dr Justin Armellin Mr H McCay Counsel for RN Raena Reyes Ms R Curran
File Number(s):	CD 171 of 2019

CORONER ARCHER

Introduction and Summary

1. Mrs Patricia Croxon (who preferred to be known as Jill) died at the Canberra Hospital (TCH) just after midnight on 5 August 2019. She was 79 years old at the time of her death. Mrs Croxon had been admitted to TCH through the Emergency Department on Saturday, 3 August 2019, with a diagnosis of community acquired pneumonia.

2. Her progress had been within normal ranges until her condition suddenly deteriorated during the morning of 4 August 2019, when she developed hypotension. Standard treatments did not raise her blood pressure and the Medical Emergency Team (MET) was called at 1.15pm. One of the nurses who attended the MET call, Registered Nurse (RN) Luke Roberts, spoke with Mrs Croxon and was told by her that she had received 'too many pills' that morning. She was transferred to the Intensive Care Unit at about 2.05pm. She suffered a cardiac arrest soon after. Resuscitation eventually restored spontaneous circulation. However, clinical assessment determined her prognosis to be poor. Mrs Croxon was made comfortable and passed away in the presence of her family.
3. At the time of her collapse, it was suspected that it had been caused by irregularities in drugs that had been administered to her at TCH. The inquest, including a hearing conducted over two days on 21 and 22 November 2022, confirmed that to be so. My findings relate those irregularities to the cause of Mrs Croxon's death.
4. Whilst I find that public safety issues arise from the inquest, I am satisfied that those issues have been addressed by changes that have occurred to drug prescription and administration practices at TCH since Mrs Croxon's death.

Jurisdiction

5. Mrs Croxon's death was formally reported to the coroner, as it fell within the terms of section 13 (1)(a) of the *Coroners Act 1997* (the Act), being a death that was "unnatural" and had arisen in circumstances which were at that time unknown. The coroner was required to hold an inquest into the manner and cause of Mrs Croxon's death and make the findings required by section 52 of the Act. That section of the Act relevantly provides:

52 Coroner's findings

- (1) A coroner holding an inquest must find, if possible—
 - (a) the identity of the deceased; and
 - (b) when and where the death happened; and
 - (c) the manner and cause of death; and
 - (d) in the case of the suspected death of a person—that the person has died.

- (4) The coroner, in the coroner's findings—
 - (a) must—
 - (i) state whether a matter of public safety is found to arise in connection with the inquest or inquiry; and
 - (ii) if a matter of public safety is found to arise—comment on the matter; and
 - (b) may comment on any matter about the administration of justice connected with the inquest or inquiry.

The Hearing and Evidence

6. A hearing was conducted on 21 and 22 November 2022. I was assisted by Ms Baker-Goldsmith of counsel appointed pursuant to section 39 of the Act. Leave to appear was granted to the Australian Capital Territory (the Territory) in respect of the interests of Canberra Health Services (CHS), as well as RN Raena Reyes and Dr Justin Armellin. Mrs Croxon's family were in attendance but were not represented. They had been provided with the coronial brief and counsel assisting had spoken to them before the hearing to ascertain matters that were of particular concern to them. During proceedings, they were invited to ask questions of witnesses through counsel assisting and on a number of occasions they did so.
7. The findings that follow are based on the evidence received during the hearing in the form of the coronial brief (Exhibit B) and the oral evidence given by witnesses.
8. Submissions were received from counsel assisting, the Territory, and Dr Armellin. RN Reyes filed submissions, adopting what had been put by counsel assisting. The family have raised matters of concern through counsel assisting. Facts that were necessary for my decision making were agreed as between counsel assisting and represented parties. The only contentious matter that arose from the hearing is the extent to which responsibility for the medication overdose that occurred should be attributed to particular nurses or clinicians.

Formal findings as to the manner and cause of death – Section 52(1) of the Act

9. An autopsy was conducted by Professor Johan Dufrou, a forensic pathologist, on 6 August 2019. Consistent with his opinion as to the cause of death (not challenged at the hearing), I find:

Patricia (Jill) Croxon died on 5 August 2019 at about 12.21am at the Canberra Hospital, Garran in the Australian Capital Territory as a result of medication related cardiac arrest (verapamil and propranolol) in a patient with community acquired pneumonia and immunosuppression associated with treatment for rheumatoid arthritis.

Mrs Croxon - the Person

10. Mrs Croxon dedicated a large part of her life to caring for others through her career as a registered nurse. Mrs Croxon, who was born and raised in Queensland, began her nursing career in Brisbane. She then briefly moved to Sydney before settling in Canberra. During her 35 years as a nurse in Canberra, she worked at the original Canberra Hospital, in general practice, childcare, aged care and in drug and alcohol referral services for ACT Health. Following her retirement, Mrs Croxon lived an independent and social life and enjoyed spending time with her immediate and extended family and many beloved friends.
11. Mrs Croxon left behind her husband, Phillip Croxon, and their two children, Ben and Katie Croxon. Prior to her admission to TCH, Mrs Croxon was planning to celebrate her 80th birthday with her family and friends. Mr and Mrs Croxon were also looking forward to celebrating their 50th anniversary together. Ben and Katie described Mrs Croxon as a caring, optimistic, and devoted mother, wife, and friend.

Mrs Croxon's Medical History

12. It is unnecessary to set out in detail Mrs Croxon's medical history, other than to note that it was complicated. At the time of her admission to hospital, she was being treated and medicated for a range of conditions apart from the pneumonia that had most recently

been diagnosed. Those conditions included hypertension, arthritis, tachycardia, and osteoporosis.

13. Having been a registered nurse prior to her retirement, Mrs Croxon was obviously conscientious about ensuring prescribed medications were taken in the right doses and at the right time.

Medications Addressing Heart Conditions

14. Mrs Croxon had experienced heart problems (arrhythmia and hypertension) for some time, had received expert cardiac advice, and was under the supervision of a general practitioner at a suburban medical centre. Before her admission to TCH on 3 August 2019, she was taking, relevantly, two medications – propranolol (Deralin) and verapamil. Propranolol was prescribed in 40 mg doses, to be taken three times a day. The verapamil had been prescribed to her as Cordilox (which is a brand name for a slow release form, as distinct from an immediate or normal release form of verapamil)¹. The last prescription of Cordilox was on 16 February 2019. She was instructed to take one tablet (240 mg) in the morning and half a tablet (120 mg) at night. The evidence suggests that the Cordilox/verapamil was prescribed to Mrs Croxon in the knowledge that Mrs Croxon was taking propranolol.

Verapamil and Propranolol and Their Effects

15. Professor Alison Jones, a highly qualified general physician, medical educator, and toxicologist, gave evidence in the proceedings by way of a report and oral evidence. She outlined the nature of these two drugs, their use, and interactions with each other. According to her uncontested evidence, verapamil is a phenylalkylamine calcium channel blocker used in the treatment of high blood pressure, heart arrhythmias, and angina. It can be prescribed in the immediate or slow release form. The form in which it is taken will affect the serum concentration of the drug. The slow release form of the drug allows for longer intervals between doses and “flattens” the serum concentration curve associated with the use of the drug. Relevantly, serum peaks can become higher if the drug is used in the immediate release form.
16. Propranolol is a non-selective beta-blocker. It is used to reduce blood pressure, reduce heart rate, and to control certain abnormal heart rhythms.
17. Whilst the two drugs can be prescribed in combination to achieve an effect superior to using one drug alone, the concomitant administration of the drugs produces a significant increase in peak plasma concentrations in both medications. A series of studies have suggested that when taken together serious, and sometimes fatal, additive cardiovascular events can occur, including cardiac arrest. Both drugs depress cardiac systolic function which can result in heart failure or cardiogenic shock, especially, according to Professor Jones, with patients with abnormal cardiac function.
18. Professor Jones’ opinion was that the concurrent administration of these two drugs in Mrs Croxon’s case “was not ... clinically indicated at any stage”. Dr Peter Grant, a Senior Staff Specialist and Deputy Director of Emergency at Kogarah Hospital (who provided an expert report and gave evidence at the hearing), opined “that there does not appear to be a clear indication for the drug combination in this instance”.
19. The management of Mrs Croxon’s heart conditions prior to her admission was not subject to detailed consideration at the inquest. No criticism is made of her general practitioner

¹ In these reasons, the expression “immediate release” is used in preference to the often used expression “normal release” to more clearly convey the differing form of the medication.

or treating cardiologist. In that regard, it is noted that Mrs Croxon had been taking propranolol and verapamil for six months or more before her admission to hospital without apparent ill effect. It was only after her admission to TCH, when there were changes in the form the medication was taken and the timing of administration of the drugs, that effects were produced that caused the cardiac arrest that took Mrs Croxon's life.

Chronology of the Course of Treatment

20. Mrs Croxon had contracted pneumonia which had not responded to treatment in the community. She was taken to TCH by her son, Ben, on the morning of 3 August 2019. Her primary complaint was shortness of breath. She was seen by Dr Armellin, a training emergency medicine registrar. He took a history from her which was detailed and contained a list of the medications she was taking. Relevantly, the note included reference to both "propranolol" and "verapamil" *and* their brand names Deralin and Cordilox (noting that Cordilox only comes in slow release form). The note describes Deralin and Cordilox being taken in amounts that were consistent with her prescription. When the Cordilox was charted (as verapamil), the correct dosage was inserted. However, the chart had a box which stated "Tick if slow release". That box was not ticked, and no other indication was entered into the chart to indicate that the verapamil should be administered in slow release form. The evidence in the inquest established that the form containing the "tick" box option was consistent with the accepted national standard of the form approved by the Australian Commission on Safety and Quality in Health Care. In the absence of a "tick", it was understood by virtue of that national standard, that the immediate release form of the drug was to be used. Therefore, the charted form of verapamil was *inconsistent* with the form of that drug that Mrs Croxon had been taking.
21. After being assessed by Dr Armellin, Mrs Croxon was moved from the Emergency Department onto the Respiratory Ward. There, she was observed by nurses and her existing medications were given as charted. Mrs Croxon was given 120 mg of verapamil at approximately 8.00pm on the evening of 3 August 2019, and 40 mg of propranolol at midnight. Where the verapamil was sourced is not entirely clear. The TCH Pharmacy was not open between 5.00pm on 3 August 2019 and 9.00am on 4 August 2019. Mrs Croxon's medications were not dispensed by the TCH Pharmacy until about 9:45am on 4 August 2019. Nursing notes suggest that the verapamil dispensed at 8.00pm may have come from Mrs Croxon's own supplies and, therefore, was in slow release form. Confirmation of this may be found in the fact that there was no sudden and precipitous drop in Mrs Croxon's heart rate and blood pressure when the medication was administered.
22. During the night of 3 to 4 August 2019, and in anticipation of the need to dispense 240 mg of verapamil to Mrs Croxon at 8.00am on 4 August 2019, 10 tablets of 40 mg immediate release verapamil were taken from the "night cupboard" by the duty clinical nurse consultant (CNC).
23. Dr Ahmadzai, a medical registrar rostered on at TCH for the evening of 3 to 4 August 2019, reviewed Mrs Croxon at about 5.00am on 4 August and discussed her medication with her. Again, detailed notes were taken, and the list of medications accurately captured the fact that Mrs Croxon was taking verapamil and propranolol, and the dose she had been taking of those medications in the community. The issue as to whether the dose of verapamil was immediate or slow release was not identified in this process of review and no change was made to the (incorrect) charted form of that medication.
24. At about 7.00am, RN Raena Reyes took over responsibility for Mrs Croxon's nursing care, including the taking of observations.

25. At about 7.30am on 4 August 2019, Mrs Croxon was reviewed by the on-call respiratory physician, Dr Ssentamu. He had no concerns about Mrs Croxon's condition at that time. As part of his assessment of Mrs Croxon, he reviewed her medication chart insofar as she had been prescribed new medications for her acute presenting condition (pneumonia). He did not review medications she usually took while in the community.
26. According to her normal medication schedule, in addition to other medications, Mrs Croxon was due to have 240 mg of verapamil (slow release) and 40 mg of propranolol concomitantly at 8.00am on 4 August 2019. At about 8.00am, RN Reyes administered to Mrs Croxon six tablets of verapamil (immediate release) that had been obtained from the night cupboard.
27. TCH Pharmacy was not open until 9.00am and, ordinarily on a Sunday, medication dispensed would not be distributed to the wards until about 9.45am to 10.00am. Prior to approximately 9.45am, there was no propranolol dispensed from TCH Pharmacy or available on the ward to be administered to Mrs Croxon. Mrs Croxon was concerned to take her propranolol at the time she took it every day. RN Reyes asked Mrs Croxon if she could wait until TCH Pharmacy opened at about 10.00am, but Mrs Croxon did not wish to wait. Accordingly, RN Reyes administered propranolol from Mrs Croxon's own supply to Mrs Croxon at about 9.30am.
28. Mrs Croxon was initially well after taking these medications, and was self-mobilising with the assistance of a walker.
29. TCH Pharmacy dispensed Mrs Croxon's charted medications at about 9:45am. The unchallenged evidence of Mr Daniel Lalor, Chief Pharmacist at TCH, on this point was that a review was undertaken of the medications administered from the night cupboard on the morning of 4 August 2019 (time unknown), after an order was received for verapamil for Mrs Croxon. That order was for the immediate release version of that drug. It is apparent that in response to that order, a *slow release* version of verapamil was dispensed at about 9.45am and could have arrived on the ward anywhere between 10.00am and 1.00pm. Mr Lalor went on to state that he believed attempts were made to locate the packet of immediate release verapamil on the ward to "determine how many tablets had been administered". However, the packet could not be located. It is not clear whether Mrs Croxon's sudden deterioration had occurred by this time.
30. The circumstances of Mrs Croxon deterioration and death are set out above.
31. The circumstances of Mrs Croxon's death were immediately reviewed within TCH. The systemic shortcomings addressed in the subsequent inquest were noted. The initial conclusion reached was that Mrs Croxon had not been administered immediate release verapamil on the morning of 4 August 2019. Subsequent inquiries and the coronial investigation clearly indicated the contrary to be so.

The Mechanism of the Overdose

32. Professor Jones attributed the cause of Mrs Croxon's cardiac arrest to a number of factors. The combined use of propranolol and verapamil caused her blood pressure to drop. Further, the dose of verapamil given to Mrs Croxon at 8.00am was in immediate release form. This caused the serum levels of this medication to be higher than normal and to have peaked earlier than usual (within a few hours rather than four to six hours), causing Mrs Croxon's heart rate to be further depressed. The delay in the administration of propranolol meant that it was being absorbed into the blood stream and exerting a significant effect on Mrs Croxon's heart rate and blood pressure within the same time frame and at a time when the serum levels of the verapamil were (unusually) high.

33. Mrs Croxon's ability to tolerate this cardiac insult was limited due to the pneumonia she had contracted and the significant number of co-morbidities she suffered from. It was Professor Jones' view that a younger and relatively well person may have survived. As Professor Jones put the matter, the verapamil and propranolol "were material" to Mrs Croxon's demise. There were, in her view, "multiple contributing factors to Mrs Croxon's demise". Professor Duflou expressed similar sentiments. In a supplementary report to his autopsy report, he opined that Mrs Croxon's co-morbidities played a "not insignificant" role in her deterioration and ultimate death.
34. The evidence tendered at the hearing did not suggest that the administration of the correct dose of verapamil but in the wrong form, of itself, caused the cardiac arrest. Nor did the evidence rise to the level of suggesting that it was, on its own, *capable* of causing that to occur. It was a combination of factors that led to the cardiac arrest; an unwell patient with a range of acute and long-term morbidities, a possibly inappropriate association of the two medications, even before Mrs Croxon came to TCH, an administration of verapamil in immediate release form, and a delay in the administration of propranolol.

The Failure to Tick the Box and the Subsequent Failure to Identify the Error

35. The evidence established that Dr Armellin's assessment of Mrs Croxon performed at 1.32pm on 3 August 2019, in the Emergency Department, was competently and carefully performed. The notes of the consultation are very detailed and thorough. It was reasonable for him to chart medications that had previously been prescribed in the community, including verapamil and propranolol. The medications Mrs Croxon had been taking were accurately captured. His care plan was appropriate, and he consulted with a physician. The impression I took from his evidence was that he is a caring and professional doctor. Dr Armellin simply did not write "SR" against the doses of verapamil, tick the box in the medication chart or otherwise note the charted medications to indicate that the dose should have been slow release. He could not say if he was busy, distracted or rushed. It is likely that he was busy, and all those factors may have been at play. I make no criticism of him. He made an error which he frankly admitted and which he did not, before me when giving evidence, seek to rationalise, minimize, or explain away.
36. Mr Lalor frankly conceded that verapamil was known to be a problem drug because of choices that had to be made as to the form (slow release or immediate release) in which it should be administered. He was confident that the error seen here (the failure to tick the box) had occurred in the past. That being so, the procedures in place surrounding the charting, sourcing, and administering of medications should have been sufficiently robust for that error to have been identified and corrected. There were such procedures, however, they failed to bring to light the error that had been made in a time frame that made the discovery meaningful.
37. Counsel for the Territory noted in submission that there were several "inbuilt" opportunities for medications prescribed in TCH Emergency Department to be reviewed. Those opportunities, and my findings as to them, are as follows:

(a) *Digital Input of Medication Chart*

At the time, the usual process was that when a patient was admitted to the Respiratory Ward, the paper medication chart from the Emergency Department would be inputted into the electronic system by a doctor. This provided an opportunity for a review of medications. However, as Mrs Croxon was admitted to the ward at 5.05pm on Saturday, 3 August 2019, that review had not been conducted prior to the administration of the immediate release verapamil.

(b) *Medication Reviews*

Mrs Croxon was reviewed by other doctors before the relevant drugs were administered. Dr Ahmadzai, a medical registrar, reviewed Mrs Croxon early on 4 August 2019. It appears from the records that Dr Ahmadzai did, in fact, review the medications Mrs Croxon was taking. However, his evidence (in statement form) suggested his focus was on the presenting condition (pneumonia), the medications that had been prescribed to address it, and their interactions with immune suppressant medication rather than the totality of her medication regime. He did not put any annotation against verapamil indicating whether it was immediate release or slow release. Whether he simply reproduced Dr Armellin's mistake, or made the same mistake independently, is not clear. Reliance seems to have been placed on the fact that the other medications had been prescribed by the Emergency Department doctor. Professor Jones' view (from the standpoint of her expertise as a medical educator) was that Dr Ahmadzai should have had the experience to recognise the potential significance of the fact that verapamil and propranolol were being administered together. However, the issue before me was not the taking of the medications together (that was an established pattern) but knowing the form in which verapamil would normally be taken.

Dr Ssentamu was a consulting physician. He saw Mrs Croxon after Dr Ahmadzai. He was of the view that his responsibilities (in the absence of an obvious error) did not extend to reviewing the accuracy of all the medications charted in the Emergency Department or questioning the juxtaposition of these two medications that had been administered together safely in the community for some time. In his view, that was the responsibility of a junior doctor. His focus was on the presenting complaint. He believed that at some point during her time on the ward, in ordinary business hours, Mrs Croxon's medication chart and her existing medications would be checked by a ward pharmacist. Dr Grant and Professor Jones indicated that they would expect a consulting physician to be alive to the significance of the verapamil dose. However, Dr Ssentamu gave evidence that the dosage of verapamil of itself did not catch his attention and that he did not necessarily assume that a prescription of 240 mg suggested it was to be administered in slow release form.

Dr Ssentamu suggested, that apart from patently obvious irregularities in charted medications, a complete review of medications at every patient review would be unworkable from a time and resource perspective. I see some force in that contention.

I make no criticism of either doctor. Whilst it is undoubtedly true that all clinicians, nurses, and pharmacy staff have a role in reviewing charted medications to ensure they are administered in therapeutic doses, here the question was not one of dosage but the form in which it was given. That required a level of "suspicion" that a pharmacist is likely to have brought to a review of charted medicines. However, on the evidence before me, it is understandable that medical staff overlooked the issue in light of Mrs Croxon's medication history, the complexity of her comorbidities, and the nature of her presenting illness. Further, and as indicated, there were two drugs administered that caused the cardiac arrest - verapamil and propranolol. I would not expect them to independently review decisions previously taken by a cardiologist to prescribe these medications together. Neither clinician was concerned with issues surrounding the *time* at which dosages were administered nor, on the evidence, would I expect them to be.

(c) *Dispensing Medication from the Night Cupboard – CNC Nurse Jis*

TCH Pharmacy did not in 2019, and does not operate today, on a 24 hour a day basis. This is addressed in greater detail below. If medication was required out of hours, TCH Pharmacy supplied an out of hours medication cupboard called the “night cupboard”. A single CNC on shift has access to that cupboard. Once a drug is accessed, the CNC records the amount of the medication supplied to the patient on that patient’s medication chart. Those charts are collected by a staff member from TCH Pharmacy each morning.

They are checked *at that time* by a pharmacist to ensure that the appropriate medication has been selected. Therefore, the checks that normally occur within TCH Pharmacy at the time the drug is dispensed (here, verapamil) are not in place out of hours.

At the time of Mrs Croxon’s admission to TCH, the night cupboard contained immediate and slow release verapamil.

Nurse Shany Jis was the CNC on the night of 3 to 4 August 2019. She followed the accepted process in dispensing immediate release verapamil. Dr Jones’ view was that her decision to source immediate release verapamil from the night cupboard was reasonable, given there was a medication chart written up by a doctor and an assumption that the absence of a tick on the medication chart positively indicated that the drug should be administered in an immediate release form.

I make no criticism of her.

(d) *Administration of Medication by Nurse Reyes*

It was suggested by Dr Grant that the number of tablets (six) required to make up the 240 mg dose of verapamil should have caused doubt to have been raised and that a dose of 240 mg of itself should have suggested a slow release formulation was intended. As Dr Jones indicated in evidence, it should not be assumed that nursing staff would have the level of technical insight required to question whether the correct dose should be in a slow release form. Like other staff involved in Mrs Croxon’ care, RN Reyes owed a duty to ensure that medication administered was consistent with therapeutic outcomes. In reality, given the error was not obvious, the involvement of doctors and a CNC before her in documenting the form of the verapamil dose, and the positive assumption she was required to draw from the charted record that the verapamil should be dispensed in immediate release form, her failure to ask questions about the release form of the correct dosage should not attract criticism. Given the limited holdings that were kept in the night cupboard, it was, as she suggested, not uncommon to have to make up larger dosages with a greater than usual number of lower dosage tablets. In any event, the issue was not the dosage but the form of the dose. Similarly, there is no basis to impugn RN Reyes’ decision to administer the propranolol at the time at which she did. In the first instance, the delayed dosing is unlikely to have a significantly detrimental effect if the correct form of verapamil had been administered. Second, both Mr Lalor and Professor Jones opined that a registered nurse could not be expected to have a sophisticated understanding of the pharmacokinetics of these medications.

Consistent with that expert opinion, I make no criticism of Nurse Reyes.

(e) *The Role of the Pharmacy*

The critical issue in this inquest is the role played by TCH Pharmacy. Mr Lalor's unchallenged evidence was that if a medication chart suggested administration of 240 mg of immediate release verapamil, a pharmacist would assume that it should be administered in a *slow release* form and a charted entry to the opposite effect would be reviewed for its accuracy.

However, the effectiveness of this safeguard was qualified at that time by a number of factors:

- As already noted, TCH Emergency Department, at that time, did not have electronic records and an electronic record would be created after admission to the ward. At that time, the record would be capable of review by TCH Pharmacy. However, the creation of the electronic record on the Electronic Medication Management (EMM) system was not immediate (it was normally created within 24 hour of admission). As Mrs Croxon was admitted to the Respiratory Ward at 5.05pm on Saturday, 3 August 2019, the transfer to the electronic system had yet to be undertaken.
- TCH Pharmacy was not open 24 hours a day and on weekends was staffed on a heavily reduced basis. Therefore, in this case, night cupboard processes operated; meaning normal pharmacy checking processes were not available even for "problem" medications such as verapamil that were dispensed through this process.
- The relevant Pharmacy Board guideline in place in 2019 required that a Medication Reconciliation Form (MRF) would be completed for every patient. The purpose of the form was, amongst other things, to require a check of the medication being taken by the patient on admission. The process was in addition to the EMM process. Mr Lalor indicated that "ideally" the MRF is completed by a pharmacist within 24 to 48 hours of admission. However, due to the number of pharmacists available (especially on a weekend), it "is not always possible" to complete the MRF for all patients within that period. According to Mr Lalor, as Mrs Croxon was admitted on a Saturday night, and given reduced staffing within TCH Pharmacy over the weekend, it was unlikely that an MRF would be completed before Monday. As already noted, the possible error in the form of the dosage was identified by TCH Pharmacy sometime around 9.45am on 4 August 2019. The error was not treated as a medical emergency, and it is not clear that anything was done to bring that possible error to the attention of treating clinicians before Mrs Croxon's collapse.
- In 2019, there were outposted pharmacists in the wards at TCH. The presence of those pharmacists meant that there was an available resource for medication charts to be reviewed. However, at the time, there were no out-posted pharmacists in the Emergency Department and no outposted pharmacists worked in any of the wards over the weekend.
- There were, according to Mr Lalor, a number of vacancies within the establishment of the pharmacists employed at TCH at the time of Mrs Croxon's admission. However, the risk created by these vacancies may not have been relevant in Mrs Croxon's case, given that there was no evidence that this would have resulted in an earlier review of Mrs Croxon's medications.

- There was an on-call pharmacist available after hours and on-line research facilities services to allow issues of concern to be addressed. However, unless a risk issue was identified, these particular resources would not make a significant difference. Here, the risk associated with administering verapamil in an immediate release form was not identified.

Matters of Public Safety

38. The facts, as I have found them, give rise to matters of public safety for the purposes of section 52(4) of the Act.

Prescription and Administration Issues

39. At the inquest, I was presented with evidence that since Mrs Croxon's death, Canberra Health Services (CHS) have modified processes in a way that address many of the systemic shortcomings that her death highlighted.

(a) Electronic Care Record

CHS have introduced, as recently as 12 November 2022, a Digital Health Record (DHR) system. Patient records are now produced and available in a digital form. This system has relevance to addressing the shortfalls apparent in Mrs Croxon's care:

- (i) Patient records within the ACT public health service are now digital. Within TCH all medication orders are made electronically using the DHR. That process has the advantage of forcing clinicians to consider dosing options in particular situations. In respect of verapamil, for example, the prescribing clinician must select between slow and immediate release versions of the medication before an order can be placed. In respect of that drug, a low dose (40 mg) is set as the default dosage level and that must be adjusted manually. The DHR system allows medical staff (when the patient consents) to access the Commonwealth *My Health Record* which can allow access to community pharmacy records for review. This has the added advantage of not requiring transcription of the prescribed medications, meaning there is less misinterpretation risk.

The presence of this electronic record at the time of Mrs Croxon's admission is likely to have forced Dr Armellin to consider the form in which the verapamil was to be administered. Of course, human error cannot be completely eliminated, even within the parameters of the DHR system.

(b) Changes to the After-Hours Medication Cupboard

The introduction of the DHR system has been accompanied by changes to the night cupboard system.

- (i) TCH Pharmacy no longer removes the medication from the manufacturers box. The CNC can scan the barcode from the box which links to the DHR system. The DHR will confirm that this is the medication prescribed for the patient. The other safety features of the DHR system I have described at paragraph 36(a)(i) are also thereby attracted.
- (ii) The number of medications placed in the night cupboard have been limited. The medications that have been removed are those that are available elsewhere in TCH and are not required on an urgent basis. Immediate release verapamil is one of the medications that has been removed.

(c) *Changes to the Administration of Medication*

When a registered nurse comes to administer medication, they identify the patient through a barcode. This again links that process into the DHR system. They can more readily confirm they have the right patient, the right medicine, the right dose and form of the medicine, and that it is being given at the right time.

40. I make no detailed findings as to the efficacy of the changes to processes I have outlined. That evidence was not before me. However, I do find that had they been in place at the time, it is likely that the error involved in the incorrect form in which verapamil was administered to Mrs Croxon would not have occurred.

TCH Pharmacy Practices

41. Mr Lalor gave evidence that the structure of TCH Pharmacy had changed since 2019. In 2019, the number of clinical pharmacists was limited, and the pharmacy staff worked in a centralised pharmacy model. Today, there is a greater emphasis on providing pharmacy services on a decentralised model with 23 pharmacy staff who work primarily embedded in clinical teams on the ward (including the Emergency Department). This change facilitates the provision of a real time quality assurance and advice function in the context of medication prescription issues. I accept that these changes are likely to significantly reduce the incidences of medication overdoses during the week.
42. What has not significantly changed is the operation of TCH Pharmacy on weekends. On weekends, TCH Pharmacy continues to operate on reduced staff and pharmacists are not routinely present on the ward.
43. I was urged by counsel assisting to consider a recommendation that the full TCH Pharmacy service be available on 24 hour, 7 days a week basis. I decline to do so. As Mr Lalor indicated, it is routine practice for hospital pharmacies across Australia not to have a pharmacist on site 24 hours per day. At present, only one hospital in Australia has a 24 hour, 7 days a week pharmacy operating. The issue is one of funding, and budgetary priorities have to be determined considering the overall context of the operation of TCH and CHS. No evidence was called at the inquest as to the viability of such a proposal in the ACT.
44. I make no recommendations in respect of the operation of the TCH Pharmacy.

Findings as to Matters Concerning the Administration of Justice

45. Section 52(4)(b) of the Act gives me a discretion to comment upon any matter about the administration of justice connected with the inquest.
46. In submission, counsel assisting and Mrs Croxon's family made criticism of the delays that were involved in obtaining statements through the ACT Government Solicitors Office (ACTGS) from Territory employees. The delay issue was not agitated at the hearing and arose only on submission.
47. I note that it is standard practice for the ACTGS to give Territory employees assistance in providing statements to coronial investigators. Particular reference was made by the family to the failure to promptly take a statement from Dr Armellin.
48. It is the Coroner who has the power to determine the scope of an investigation conducted in respect of a death that falls within the terms of section 13 of the Act. The Court is able to hold a hearing in relation to any inquest: section 34 of the Act. Witnesses and documents can be subpoenaed. If there is delay in statements being produced by the Territory, the remedy lies with the Court. Timetables can be imposed and witnesses can

be called without a statement having been obtained. I met no resistance from the Territory when a request was made for Dr Armellin to provide a statement, and its late production due to a delayed request from the Court caused no practical detriment to the coronial process. Whilst Dr Armellin could not remember Mrs Croxon, he freely admitted the error he had made.

49. The CNC, Nurse Jis, provided a statement to the Court. She was not available at the time of the hearing. Criticism was made by the family of the failure to call her. The view I took was that the import of any evidence she could provide was sufficiently disclosed in her statement. Professor Jones had provided an opinion before the hearing that CNC Jis had acted appropriately.
50. The family requested that the Coroner, in his recommendations, acknowledge the pain and suffering endured by the family as a direct result of their mother's sudden and unnatural death, and also because of the preventable delays in the resolution of the matter that occurred in the years after.
51. I make that acknowledgement. Section 3BA of the Act requires inquests to be carried out in way that recognises that the death of a person, and an inquest into the person's death has a significant impact on the person's family and friends. Again, as in other matters, I am forced to acknowledge that that statutory obligation has not been discharged. Delay in the disposition of the coronial inquest can add significantly to the trauma experienced by surviving family, and on behalf of the Coroner's Court, an apology is made to Mrs Croxon's family for that delay and the trauma it has caused. I also sadly acknowledge that other cases still within the coronial system evidence even greater delay than is present here.
52. Mrs Croxon lived a full and productive life. She was loved by her family. She contributed much to the community through her work as a nurse and otherwise. Mrs Croxon lost her life in circumstances that should not have arisen. Although she was vulnerable because of her general health, she and her family might reasonably have anticipated that her treatment at TCH would result in her being made well enough to be sent home in the loving care of her family. The picture of her last moments painted by her family in their statements and submissions will be forever etched in their memory.
53. On behalf of the Court, I express my condolences to Mrs Croxon's family.

I certify that the preceding fifty-three [53] numbered paragraphs are a true copy of the Reasons for Decision of his Honour Magistrate Archer.

Associate: Jessica Friendship

Date: 15 February 2023