CORONERS COURT OF SOUTH AUSTRALIA

INQUEST INTO THE DEATH OF KATE MARIE SYLVIA

[2026] SACC 30

Inquest Findings of her Honour Deputy State Coroner Kereru

12 August 2026

CORONIAL INQUEST

Examination of the cause and circumstances of the death of a young woman who presented to health care providers with a headache and neurological symptoms. She was eventually diagnosed with stroke. She died a short time later after treatments were commenced. The Inquest explored the circumstances that led to the incorrect diagnosis of migraine and the delay in diagnosis of her actual condition.

Held:

1. Kate Marie Sylvia, aged 32 years of Magill, died at the Royal Adelaide Hospital on 6 December 2021 as a result of cerebral venous sinus thrombosis complicated by right intracerebral haemorrhage.

2. Circumstances of death as set out in these findings.

Recommendations made.

Counsel Assisting: MR M KIRBY THEN MR D EVANS

Family: MRS K SYLVIA
Counsel: MR N XENOPHON - Solicitor: LINDBLOMS LAWYERS

Interested Party: CENTRAL ADELAIDE LOCAL HEALTH NETWORK & SA AMBULANCE SERVICE
Counsel: MS E DENBIGH WITH MS S SLOAN - Solicitor: CROWN SOLICITOR

Witness: MR J MURCHLAND, DR L HENDERSON, MS J COLLINS, MS C MILLS, MS S GREEN, DR K TEW & ASSOC PROF P HAND
Counsel: MS E DENBIGH WITH MS S SLOAN - Solicitor: CROWN SOLICITOR

Witness: DR R DUFFIELD
Counsel: MS J CLIFF - Solicitor: DW FOX TUCKER

Witness: DR Y PEERBAYE
Counsel: MR R BÖNIG - Solicitor: FINLAYSONS LAWYERS

Witness: DR V RANIGA
Counsel: MS M EATON THEN MR T DAYMAN - Solicitor: GILCHRIST CONNELL

Witness: ASSOC PROF A LEE
Counsel: MR N XENOPHON - Solicitor: LINDBLOMS LAWYERS

Hearing Date/s: 10/12/2024-12/12/2024, 16/12/2024, 22/04/2025, 28/04/2025-02/05/2025

Inquest No: 48/2024 **File No/s: 2683/2021**

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Introduction

1 The Court heard evidence about two presentations for emergency care in December 2021 which culminated in the death of a 32-year-old woman as a result of cerebral venous sinus thrombosis (CVST). A number of clinicians involved in the care gave evidence and the Court was assisted by the evidence of numerous medical experts. Professor Anne-Maree Kelly, Professor Cassandra Szoeke, Associate Professor Andrew Lee and Associate Professor Peter Hand all gave their expert opinions about the issues arising during the Inquest. Corporate evidence about the workings of the health system was provided by SA Health's Nursing Program Director, Diana Taylor.

Kate Sylvia

2 Kate Sylvia was born on 18 April 1989. She grew into an independent young woman who left her family home in Millicent at age 17 to live in Adelaide. She rented for some time and then purchased her own home at Magill. Her parents followed, moving to Adelaide about a year after her. She had a creative streak, crafting items like jewellery, candles, embroidery and wood burning pieces. She was an avid reader and she had a passion for helping kids. She was highly organised and articulate. The combination of these skills and interests led her to employment at Pembroke Middle School where she worked as a librarian. She was good at her job and was held in high regard.[1]

3 Kate's family,[2] with whom she maintained a very close relationship, have told the Court that she was happy with her life. She liked bushwalking, visiting art galleries and markets and she also enjoyed pushing herself into challenging activities like canyoning and rock climbing.

4 As a young child, Kate was diagnosed with dyspraxia. It did not hold her back, she just took longer to do some things like learning to ride a bike. As a teenager, Kate was diagnosed with Bipolar II disorder and anxiety. She was prescribed medication and had ongoing visits with her psychologist but did not require any further treatment for these conditions.

5 Kate spoke well. Her family often received questions from people about where her 'posh' voice came from.[3] Her manner of speaking will become relevant later.

6 Over the years, Kate suffered from occasional headaches. A review of the medical records found no evidence that Kate had presented to her GP with migraines, or that she had ever been diagnosed with that condition.[4] There is no evidence that she ever underwent any scans in order to investigate headaches. Kate's mother, Kathryn Sylvia, observed that her headaches would sometimes occur around the time of work events that Kate wanted to ensure were done right, and that she would complain of a headache

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1 Exhibit C10
2 At the request of Ms Sylvia's family, she will be referred to as Kate throughout this Finding
3 T40
4 Exhibit C5 and T28

towards the end of term when staff and students were stressed.[5] Mrs Sylvia gave evidence that suffering a headache with associated vomiting was not something that Kate had experienced before.[6]

Mrs Sylvia's advocacy

7 I take this opportunity, early in this Finding, to acknowledge the considerable efforts Mrs Sylvia undertook to advocate on behalf of her very ill daughter. To have her concerns diminished, and at times dismissed, before Kate's death will understandably be a continuing source of deep trauma for the Sylvia family.

8 I am hopeful that some comfort can be derived from the acknowledgement that I have accepted the entirety of Mrs Sylvia's accounts of Kate's symptoms and interactions with clinicians, even where it conflicts with other accounts.

9 It was apparent to me that not only did Mrs Sylvia pay close attention to her daughter when she hurried home from interstate, she also made detailed contemporaneous notes of these events as they related to the circumstances leading up to Kate's death. These were received into evidence. These notes corresponded not only with Mrs Sylvia's oral evidence, but also with important objective facts testified to by others and the events set out in the clinical records. I am also reminded that Mr and Mrs Sylvia left a close family member who was nearing end of life to travel home to Kate, such was their concern at her text messages seeking help.

10 This case, like many others heard in the Coroners Court, highlights the danger of not affording adequate weight to the concerns of worried parents or caregivers in clinical situations, even when the patient is an adult.

11 I am of the view, as I will detail in this Finding, that if greater attention had been paid to Mrs Sylvia's historical information, observations and concerns, the likelihood of preventing Kate's death may well have increased.

2 December 2021

12 In December 2021, Kate's parents were visiting Kate's grandmother in Mildura, saying their final farewell to her as she was not expected to live much longer.[7] While they were away, Kate would go to her parents' house to feed their cat and water their garden.

13 At 1:26 pm on 1 December 2021, Kate messaged her mother and said that she had a horrible headache.[8] The following morning at 6:40 am, Kate sent another message to her mother which read 'Sorry, migraine pain. Agony, dying on the bathroom floor'. A few hours later, Mrs Sylvia woke up and read the message. In the context of the circumstances, Mrs Sylvia took it very seriously, as Kate had been giving them space to deal with saying goodbye and she did not have a history of sending messages of that nature.[9] Mr and Mrs Sylvia immediately commenced the journey home from Mildura and messaged Kate to advise her of that.

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5 T28
6 T85
7 T28
8 Exhibit C10 at 3
9 T29

14 While en route, Mrs Sylvia called Kate, at 9:08 am. The call lasted for four minutes. Kate described her head hurting so much that she had to sit on the bathroom floor. She said that she was vomiting. Mrs Sylvia noticed that Kate was slurring her words, describing her as sounding like a drunk person.[10] She told Kate to open the front door and that she would call for an ambulance.

15 The audio recording of Mrs Sylvia's call was admitted into evidence as part of Exhibit C9. The call commenced at 9:18 am.[11] In it, Mrs Sylvia is heard saying that Kate had a migraine with a 'huge stabbing pain', that she had had a headache since yesterday, 'but this has just escalated', describing that 'she can't talk properly', that her speech was 'all bleurgh' and that while she was breathing normally, she was talking 'like a drunk person'. She said that Kate was not completely alert. She explained that Kate had experienced headaches before but that since 5 am she had a stabbing pain and 'she's never had a pain like that before so she's a bit frightened'.

16 The call taker at the Emergency Operations Centre entered onto the ambulance dispatch system:

> 09:20:33 …
> INITIAL CALL: Name= KATHRYN (MOTHER - REMOTE)
> …
> Problem: MIGRAINE SINCE 5AM THIS MORNING, VOMITING, UNABLE TO KEEP FLUID DOWN, TROUBLE TALKING - HEADACHE SINCE YEST, WORSE THIS MORNING
> …
> Dispatch CAD Code: 18C01
> Determinant Level: Not alert
> --: She is not completely alert (not responding appropriately).
>
> 09:21:34 …
> Call Reconfigured to 18C01L
> Suffix Text: Less than "T" hours since the symptoms started
> --: ***She is not able to talk normally***.
> --: ***There was a sudden onset of severe pain***.
> --: There is no numbness or paralysis.
> --: There has not been a recent change in behaviour.
> --: These symptoms started within the approved treatment window at: 0500
>
> 09:21:37 …
> EVENT COMMENT= -: The caller was unable to get close enough to the patient to use the Stroke Diagnostic.[12]

17 Kate was assigned priority 2 with a target timeframe of attendance within 16 minutes. A crew was dispatched at 9:21am.

18 The call taker phoned Kate at 9:24 am. The audio of that call was also admitted into evidence. Kate sounded very unwell. During the call, she can be heard vomiting. Kate agreed that there had been a sudden onset of stabbing pain. She was asked when her symptoms started and she said 'I woke up with it'. Objectively, without any prior

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[10] T29 and T31
[11] Exhibit C10 at 3
[12] Exhibit C13 at 1-2; emphasis added

experience of Kate's manner of speaking, her speech did not sound 'slurred' during the call, but she sounded very unwell and it could not reasonably be said that her speech was in all respects 'normal'.

19 During this call, further information was added to the dispatch system:

> 09:25:07 …
> Problem: MIGRAINE SINCE 5AM THIS MORNING - STABBING PAIN, VOMITING, UNABLE TO KEEP FLUID DOWN, TROUBLE TALKING - HEADACHE SINCE YEST, WORSE THIS MORNING
> Call Reconfigured to 18C03L
> Determinant Level: Speech problems
> --: She is completely alert (responding appropriately)
> --: 1st party discussion verified her condition.
>
> 09:25:40 …
> EVENT COMMENT= Call Reconfigured to 18C04L
> Determinant Level: ***Sudden onset of severe pain***
> --: ***She is able to talk normally***.[13]

20 Paramedics arrived to Kate at 9:30 am. The attending paramedic was James Murchland and he was accompanied by an intern paramedic, Lily Cross. Mr Murchland gave oral evidence at the Inquest and Ms Cross provided an affidavit which was received into evidence.[14] Mr Murchland qualified in paramedicine in 2014. In 2021, he was a clinical instructor; effectively training new paramedics under an apprenticeship-type model. Given the time that had passed and the hundreds of patients he had seen since, he had no independent memory of Kate's case[15] and gave evidence with reference to the records. Mr Murchland said that he saw these kinds of cases 'all the time'.[16]

21 Mr Murchland gave evidence that all of the information extracted above would have been available to him on the Mobile Data Terminal (MDT) in the ambulance.[17] He explained that the information presented on the MDT is more often than not different from the case that he sees when he arrives. He said that while he did not disregard the MDT information, he is required to make his own assessment of the situation. He gave an example of being sent to aged care facilities for suspected strokes because the patient has trouble talking, but when he arrives the patient has an infection and delirium which accounts for the difficulty speaking. He said that the dispatch system draws out red flags in each case, and that there are many jobs where those red flags are not apparent upon arrival.

22 Kate told Mr Murchland that she had experienced migraines, at a frequency of about one each six months. She told him that she had had imaging done about two years earlier with nothing found.[18] Mr Murchland conducted a full set of observations and a neurological assessment. He explained that a neurological assessment can take two to three minutes where nothing is found, or up to 10 minutes where things are abnormal. He noted a slightly high blood pressure, a slightly low body temperature and a slightly raised

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13 Emphasis added
14 Exhibit C4
15 T207, T210 and T232
16 T243
17 T209, T210 and T231
18 Exhibit C6a; coronial investigations did not uncover any such imagery

blood glucose level. He explained that pain can affect the sympathetic nervous system which might bring about blood pressure and blood sugar increases. Mr Murchland said that during his assessments he would have been assessing Kate's speech, looking for any signs of disturbance. He explained that, at the time, he was using two screening tools for stroke; the ROSIER, or Recognition of Stroke in the Emergency Room, and ACT, or Arm Chat Tap, which focuses on a drift test of the arm.[19]

23 Mr Murchland recorded, among other things, on his patient clinical record:

> Patient medical history
> Type 2 Bipolar, previous migraines with imagery done approximately two years ago (no abnormality detected)
>
> Medication
> Escitalopram, doxycycline, levonorgestrel
>
> History
> 31 year old female from home. Awoke with self-described migraine presenting as 'stabbing' pain posterior to right ear referring up into right parietal region. Pain described as constant, no relieving or provoking factors apart from light. Patient has had nausea since this time with frequent vomiting and unable to tolerate oral fluids or take analgesia. SAAS called.
>
> On arrival
> Patient seated on floor in bedroom
>
> On examination
> Central nervous system – alert and orientated, Glasgow Coma Scale 15, mildly photophobic, pupils equal and reactive to light, nausea-vomiting, headache as described above, no facial droop, ***no speech disturbance***, no visual defect, no gait defect, equal limb motor/sensory performance, no loss of consciousness or seizure activity
> Cardiovascular system – strong regular radial, no chest pain, skin well perfused
> Respiratory – no shortness of breath, no increased work of breathing, no accessory muscle use, speaking full sentences
> Secondary, no head strike [20]
>
> (*all abbreviations expanded*)

24 Mr Murchland did not record the speech disturbance that Mrs Sylvia had described to the Operations Centre. He said that his usual practice would be to take the information reported in the callout and then ask the patient 'is this the trouble talking you're talking about' and then make an assessment as to whether that was trouble talking in the nature of slurred speech, or just someone speaking in a particular manner because they are feeling miserable.[21] He agreed that he did not have knowledge of Kate's baseline as her mother would have, but pointed out that the entries on the dispatch record revealed the report of not speaking normally followed by a report that she was now speaking normally.[22] He agreed that this could mean there were transient symptoms or merely that there were two different assessments made. He said that he would have given the report of speaking abnormally the same weight as the report of speaking normally. However,

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19 T215
20 Exhibit C6a; emphasis added
21 T238
22 T249

he did not have a memory of his dealings with Kate and it was plain that he only recorded one on the clinical record.

25 Mr Murchland said that Kate did not meet any of the criteria for either of the stroke screening tools and had observations within normal limits, allowing for the temperature measurement to be slightly off due to equipment. He said that she had no abnormal neurological symptoms when her past medical history was taken into account. He explained that it is important to identify any new symptomology which might indicate a different cause than previous migraines, and that this was more important than simply a report of a worse version of the same headache. He said Kate's case had risk factors, but was still on the low side of the risk profile.[23] He had not made assumptions about her condition, but had made an assessment of what he thought was likely. Mr Murchland postulated that the information revealed a diagnosis of likely migraine with possibility of intracranial pathology such as stroke or infection.

26 Mr Murchland said that, had there been anything abnormal about Kate's condition, he would have taken her to the Royal Adelaide Hospital (RAH). He explained that although he was aware she was taking a contraceptive pill, which, as discussed later in this Finding, is a risk factor for CVST, this was considered in the context of what Kate described as a migraine similar to previous episodes, albeit of longer duration.[24]

27 Kate was given ondansetron to address her nausea and methoxyflurane (the 'green whistle') for pain relief. Mr Murchland explained that he would expect the side-effects of the green whistle, that he said included feeling a bit drunk and dizzy, to wear off within about 90 seconds to two minutes after ceasing use.

28 Mr Murchland made enquiries of the Operations Centre about taking Kate to intermediate care rather than to a hospital Emergency Department (ED), which he had assessed as appropriate.[25] He said that where a person has a headache which is consistent with their previous episodes, and especially if they have had previous imaging, then intermediate care will frequently accept the patient, or sometimes even receive care from a higher qualified paramedic; an extended care paramedic. Mr Murchland spoke to the Health Navigator.[26] A number of calls were placed by the Health Navigator that did not get through. Two attempts were made to speak to a clinic at Hindmarsh which had a CT scanner at the time.[27] Following those unsuccessful calls, Mr Murchland suggested that he would just go to The Queen Elizabeth Hospital (TQEH). The Health Navigator then spoke to the Sefton Park clinic, which did not have a CT scanner, but could send a patient by taxi to a nearby imaging facility.[28]

29 During the oral evidence about the process involved to receive Kate into the care of HASDS,[29] I was struck by the overly complicated way in which the communication took place between the SA Ambulance Service (SAAS) and HASDS, particularly with the intermediary of the Health Navigator. It was not difficult to appreciate the risk of the loss of important information in this labyrinthine system. As will be detailed below, this

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[23] T244
[24] T233
[25] T222 and T229
[26] T222
[27] T224
[28] T224
[29] Hospital avoidance and supported discharge service, now Hospital avoidance and discharge support services

process contributed to the loss of critical information about Kate's presentation, particularly the nature of her headache and the speech abnormalities reported by her mother. Had this information been passed on through a more direct line of communication, evidence was heard that Kate would have been diverted to a tertiary hospital, rather than the intermediate care facility, where imaging facilities were readily available. I am not critical of the individuals who utilised this system, rather the system itself. I understand from evidence given during the Inquest, this practice is no longer in place.

Intermediate care

30 At this point, it is convenient to explain the concept of intermediate care. The Court heard evidence that intermediate care facilities provide a higher level of care than a regular GP for patients that might not be best suited for the ED. Other phrases used to describe these intermediate care facilities were hospital avoidance and rapid response clinics. The Court heard that the primary role of the service is to relieve pressure on the hospital system, particularly the EDs.[30] Patients are taken to intermediate care by paramedics or are referred there by ED nurses, GPs and other clinicians. An advantage of this model is that a longer period of care is able to be provided than could be in an ED. The advantage over regular GP clinics is that intermediate care facilities have access to intravenous therapies, more medications and more diagnostic capabilities. The workload of the facility is managed by the doctors determining whether or not they have capacity to take an additional patient when an enquiry is made.

31 Intermediate care clinics largely see patients with conditions like infections that need more than oral antibiotics, injuries, falls, migraines and patients who had had multiple presentations to the ED without resolution. Some patients who arrive at intermediate care are referred to an ED.

32 The relevant intermediate care facility was the Sefton Park HASDS. In 2021, the Sefton Park HASDS was staffed by one doctor (potentially with a shift overlap in the middle of the day) and about three nurses. It has since expanded to have up to three doctors, more nurses and a radiographer (alongside the introduction of a CT scanner that was not present on 2 December 2021).[31] In 2021, there were somewhere between nine and 12 beds. Doctors at the clinic had access to the full suite of protocols that existed within the Central Adelaide Local Health Network's policy framework. Mr Murchland said that the Sefton Park clinic was favoured because it was staffed by ED nurses who have come from the RAH or TQEH.[32]

Intake and arrival at HASDS

33 Returning to 2 December 2021, the Health Navigator at the Emergency Operations Centre spoke to a nurse at the Sefton Park HASDS, Jennifer Collins, who received details of Kate's case and then spoke to Dr Lyall Henderson, who was the only doctor at the clinic at the time. There were four or five other patients already in the clinic. I received an audio recording of this call into evidence. The Health Navigator asked at the outset of the call whether migraine is something that they would consider and Ms Collins queried whether the patient had 'a past history of migraine'. Importantly, there was no mention

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[30] T98
[31] T100, T148 and T420
[32] T235

of Kate's pain having a sudden onset or that it was worse than she had ever experienced before. There was no mention of her having speech issues, in fact Ms Collins was told that there is a '$^{7}/_{10}$' stabbing pain behind her right ear, which is how it normally presents, but with 'no other neuro issues at the moment'.

34 Importantly, Ms Collins gave evidence that if there had been any neurological signs described (or had been experienced previously), Kate would have fit within exclusionary criteria and would automatically not have been accepted at HASDS without reference to any doctor.[33] Ms Collins asked the Navigator whether Kate had suffered migraines before and the Health Navigator said she had and that this was how it normally presented. Dr Henderson advised Ms Collins that he would accept Kate as a patient.[34]

35 Mr Murchland then transported her to Sefton Park in the ambulance, arriving at 10:15 am. He accepted that, with the benefit of hindsight, he should have conveyed to HASDS staff on arrival that Kate was reported to have been speaking abnormally but that he had not personally observed it.[35] He spoke about the pressure that can be placed on a paramedic having to record the case in a short space of time and having to make an assessment of what from the initial callout should be recorded.[36] He agreed that if the paramedic does not record information from the callout, it is effectively denied from those who treat the patient later on who only have access to his notes. I have accepted Mr Murchland's evidence and formed the view that he made concessions genuinely.

36 Upon arrival at the Sefton Park HASDS, Kate was immediately assessed by Ms Collins. Ms Collins is a nurse of 35 years' experience, including 30 years at the Lyell McEwin Hospital in various areas.[37] She gave evidence that Kate's eyes were closed when she arrived. She was assigned a room with the lights off, although it was still bright, and walked in without issue. Ms Collins received a handover from Mr Murchland. Mr Murchland said that he had to 'sift through' all the information to decide what he wished to present during handover.[38] He said that he would be criticised if he handed over that Kate had trouble talking but then she did not have trouble talking, so he did not mention her speech. Ms Collins was also not told that Kate was on a contraceptive pill. Ms Collins said that she would listen to everything a paramedic told her and then would do her own full assessment. Ms Collins said that she found 'no red flags, no abnormalities' in her assessment.[39] In particular, Ms Collins recalled that Kate's speech appeared to her to be normal at the time, although 'she didn't want to speak a lot because her headache was still there'.[40] Ms Collins gave Kate a flannel to put over her eyes. Ms Collins said that if Kate had described her headache as 'severe', then she would have considered that a red flag.[41] Ms Collins recorded in her notes under the heading 'SITUATION', 'Migraine history of 4 day headache. Feels like normal migraine'.[42]

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33 T424, T426 and T432
34 T395
35 T253
36 T254
37 T393
38 T251
39 T399
40 T400
41 T434
42 Emphasis added

37 Ms Collins was not privy to the calls to SAAS (including Mrs Sylvia's call) and the previous symptoms reported by Kate's mother were not passed on to her. The information recorded in the notes by Ms Collins was from her direct clinical contact with Kate. However, already the classification of a headache – being a migraine of 4 days, that felt like a normal migraine – was quite different to that which Kate herself had reported to Mr Murchland. This is not a criticism of Ms Collins, but rather an observation that the original concerning symptoms had taken on a different hue; more reassuring and in line with a recurring condition suffered by Kate. This of course was not the case.

38 After Ms Collins, Dr Henderson assessed Kate. In December 2021, Dr Henderson had worked at the Sefton Park HASDS for a few months. Dr Henderson qualified in medicine in 2014 and had worked in various roles since. He had no training specifically in emergency medicine, except that he had completed training in Level 2 Advanced Life Support before commencing work at Sefton Park.

39 Dr Henderson gave evidence that the Sefton Park HASDS dealt with younger patients with headaches against a history of migraine a few times a week, with Dr Henderson dealing with about one of those cases a week. In his time at Sefton Park leading up to December 2021, he had dealt with about a dozen cases of headache and had referred none to the ED.[43]

40 Ms Collins gave evidence that she did not have any conversation with Dr Henderson prior to him seeing Kate. She said if there were any red flags she would have spoken to him first.[44] In contrast, Dr Henderson gave evidence that he did receive an oral handover from a nurse. During that handover he was told that there was a four-day history of the headache but he was not told that Kate had her eyes closed or that she had limited speech.[45] The handover that he recalled was consistent with the written notes.

41 Dr Henderson gave evidence about the impression he formed of the case from the outset. He said that the verbal telephone handover, the nursing handover and the paramedic's paperwork were all consistent; they raised a self-described migraine, a unilateral right-sided headache that was relatively constant with no significant provoking factors other than light.[46] He said that no sources raised any neurological features, in particular no facial droop, visual defects or speech disturbance and there was normal limb movements and normal pupil reactions.

42 Dr Henderson explained that after reviewing the documentation (but not the nursing note),[47] he spent time seeing Kate. He thought she was a good historian. He tested whether her current presentation was consistent with previous presentations, applying his clinical judgement. He said that she remarked that her current headache was more severe, but still in keeping with previous episodes.[48] His discussion with her was over about 20 minutes. He noted that all of her physiological observations were normal and that she had moderate severity pain. In order to exclude a non-migraine cause, he gave evidence that he conducted a neurological examination over about 20 minutes comprising of tone,

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43 T147
44 T429
45 T193-T194
46 T106
47 T190; Ms Collins agreed that it would not have been available for Dr Henderson to read at that time (T428)
48 T107

power, reflex, coordination and sensory assessments.[49] Given that he detected nothing abnormal, he recorded the result of all of these examinations as 'Neurology grossly intact'. He gave evidence that he then used a testing kit to conduct an examination of the cranial nerve responses for nerves 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12, and recorded 'Cranial nerves NAD'.[50] Dr Henderson initially gave evidence that during his examination he asked Kate to ambulate and she was able to walk normally; he recorded 'Ambulating independently' which reflected that assessment and his observation of Kate walking to the toilet normally.[51] This assessment was at odds with medical records that established problems with coordination and fine motor skills.[52] Dr Henderson then described that his observation of Kate walking was incidentally observed later in the afternoon, rather than it being at his request during the examination.[53]

43 Throughout these assessments Dr Henderson said that Kate had normal speech, sounding tired as though she had been through an ordeal and slightly slower than the average person, but not to a pathological level. He said that whether slow talking is a concern depended on the degree of slowness.[54] Throughout his assessment of Kate, Dr Henderson did not observe her to show any significant sensitivity to light. He said that his recollection was that her eyes were open throughout his assessments and discussions.[55] However, the nursing notes specifically record at 2:45 pm as an improvement '…[able] to hold eyes open during conversation'[56] which clearly suggested that the situation earlier was not so. Dr Henderson made no notes about Kate other than his one entry into the records, even after her death and through an internal review.[57] I considered that Dr Henderson's memory about his interaction with Kate three years earlier was not accurate but more in line with what he wished had occurred.

44 Dr Henderson said that he asked Kate about medications she was taking and that she had not disclosed that she was taking a contraceptive pill. He made no notes of any medications Kate was taking which he described as an omission.[58] He agreed that the fact that she was on a contraceptive pill was contained in the paramedic's paperwork which he had read.[59] He said it was possibly something that he had missed on the day and that he did not take it in.[60]

45 Dr Henderson then talked to Kate about his impression. He told her that he thought she was having a migraine episode again and that he wanted to take some blood tests to ensure that she was not significantly dehydrated, given she had been vomiting, and that he wanted to give her medication; aspirin and prochlorperazine. Overall, Dr Henderson estimated that he spent about an hour with Kate. Kate was administered a litre of saline fluids intravenously over an hour and was given an intravenous dose of prochlorperazine to address nausea and vomiting.

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49 T108-T111
50 Exhibit C6 at 12 and T113
51 Exhibit C6 at 12, T118 and T163
52 Exhibit C5 at 21
53 T119
54 T119 and T171
55 T158 and T167
56 Exhibit C6 at 9
57 T143 and T158
58 T139
59 T151
60 T155

46 In a note lodged at 3:59 pm, Dr Henderson recorded his assessment of Kate. He recorded that she reported 'Headache for past few days, very severe today' and 'Feels like her normal migraine only more severe'. He recorded pain and nausea and then wrote 'Nil other neurological symptoms'.

47 Ms Collins said that after the intravenous fluid drip had finished its hour-long course, Kate said that she was feeling better and that she needed to go to the toilet. Ms Collins disconnected the drip and Kate walked to the toilet unaided. Ms Collins said that Kate was walking normally, with no unsteadiness. Ms Collins observed that at this time, Kate was also less photophobic and was more talkative, telling Ms Collins about her family being in Mildura and her brother working overseas.[61]

48 About two hours after his assessment, Dr Henderson visited Kate again. He said that at this point she was markedly improved.[62] She had received aspirin, intravenous fluids and prochlorperazine. Her nausea was significantly improved and she reported that her headache had 'dramatically improved'. Dr Henderson took comfort that aspirin had made such a difference to the headache as he considered it would not have been effective if something more serious was going on. He felt comfortable beginning discharge planning.[63] He was aware that Kate lived alone and he did not want to discharge her unaccompanied. Kate said that her parents could accompany her home.

49 Mr and Mrs Sylvia arrived at Sefton Park at about 1:30 pm.[64] Due to COVID restrictions, only Mrs Sylvia was able to visit Kate. Upon Mrs Sylvia being shown to Kate, Ms Collins asked Kate 'are you feeling better now?' and Kate replied 'ah, yeah'.[65] Mrs Sylvia recalled thinking that Kate was not right and that she did not look well. Ms Collins told Mrs Sylvia that Kate looked better because she was as white as a sheet when she arrived. Mrs Sylvia came out of Kate's room and said 'can I speak to the doctor, I've got a few concerns'.[66] She said that Kate's headache did not appear normal for her. This was a pivotal point in Kate's care, which I will detail below.

50 At 2:45 pm, Kate herself reported to nursing staff that she was feeling better. She was able to keep down cups of water and dry crackers. Ms Collins recorded that she was more talkative and was able to hold her eyes open during conversations.[67] At that time, Dr Henderson visited again. He explained to Mrs Sylvia that they had given Kate fluids and painkillers and said 'she's got a migraine'.[68] Mrs Sylvia explained that Kate did not get migraines and Dr Henderson said that Kate had told him she got two a year. Mrs Sylvia then explained that they were not medically diagnosed migraines. Dr Henderson reassured her that Kate had a migraine. At this time, Mrs Sylvia said that Kate was sleeping and was not engaging in the conversation. Dr Henderson said that Kate 'remained alert, she was able to voice her opinions and talk and participate in the conversation'.[69] He said that when Mrs Sylvia raised that she did not think Kate had migraines, Kate said 'yes, yes I do' and Mrs Sylvia said 'well, you know, you haven't

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61 T403
62 T121
63 T123
64 T32
65 T34
66 T404
67 Exhibit C6 at 9
68 T34
69 T123

had a formal diagnosis of migraine'.[70] He said that Kate said 'yes mum I do get these headaches, I get them, you know, about twice a year on this right side of my head'.[71] Dr Henderson said that Kate was sitting up on the side of the bed at this point.

51 On both his and Mrs Sylvia's account, at this point, Dr Henderson had been told that Kate had no prior formal diagnosis of migraine. This was not contested. Dr Henderson explained in his evidence that a prior formal diagnosis was less important than the description of previous episodes which he was satisfied clearly indicated prior migraine.[72]

52 Dr Henderson agreed that he had turned his mind to whether Kate had suffered a stroke and he agreed that the only way to have excluded that would be to have ordered a scan, but that he decided the risk of radiation in a young person outweighed the likelihood of finding a stroke.[73] He agreed that an alternative assessment would be an MRI scan which carries no radiation risk. However, he said that if a scan was needed then the risk involved in a CT scan would have been acceptable.

53 Dr Henderson said that he then went through in 'reasonable detail' what he expected to happen post-discharge. He explained that he expected a continuous sustained improvement. He told Kate and Mrs Sylvia that often with migraine, sleep is required to have complete recovery, although he said 'there were additional statements attached to that'.[74] He then told them that if, following sleep, Kate had not improved dramatically again, then that would mean there was a need for reassessment.[75] Dr Henderson said that he offered the services of HASDS for reassessment.[76] Mrs Sylvia said that Dr Henderson was clear that the service only accepted ambulances.[77] It is noteworthy that when describing the operations of HASDS in his evidence, and in particular how patients may come to be in the service, Dr Henderson spoke of a number of sources of referral, but made no mention of any re-attendances.[78] His notes of the conversation did not assist.[79] Ms Collins stated that her discharge conversation would have been in line with what she says to other patients; 'If symptoms don't get better please seek emergency assistance, go to the ED or see your GP'.[80] It may be that what Dr Henderson intended to convey was not clear to Mrs Sylvia amongst the wider advice given, including by Ms Collins. He agreed that he might have had a discussion about the purpose of the clinic. In any event, both Dr Henderson and Mrs Sylvia agreed that there was discussion of seeking assistance if there was not improvement. Dr Henderson accepted that if Kate had returned, he would likely have transferred her to hospital.[81]

54 Mrs Sylvia gave evidence that she raised concern about Kate's condition. Dr Henderson agreed that Mrs Sylvia had expressed concerns about discharge during their discussion, effectively telling him that Kate was not herself.[82] He gave evidence that he found the

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70 T124
71 T125 and T175
72 T168
73 T176
74 T172
75 T125
76 T126
77 T78
78 T98
79 Exhibit C6 at 13
80 T405
81 T127
82 T128, T129 and T167

scenario difficult where Kate was an adult who lived out of home, and that while he listened to Mrs Sylvia's concerns, he listened more to what Kate was saying which he said was that she felt better and wanted to go home, and combined that with his clinical judgement and the absence of 'red flags'.[83] Dr Henderson explained that after the way he had seen Kate earlier, he did not expect Kate to be the best version of herself and he made an allowance for that. He said that Mrs Sylvia may not have been privy to everything that happened in Kate's life.[84] In contrast, Ms Collins said that she placed a lot of weight on information from family members.[85] She agreed that collateral information to establish a patient's baseline was important. Dr Henderson acknowledged that Mrs Sylvia knew Kate better than him and that he had never seen her at her baseline, but said that he did not let Mrs Sylvia's view 'overrule' the other information he had. He contemplated in evidence that maybe he should have, and he said that in future he would give greater consideration to information from family which would assist him to have a greater understanding of the patient's baseline.[86]

55 Dr Henderson agreed that Mrs Sylvia had said words to the effect of Kate's condition seemed worse than anything she had observed previously.[87] Mrs Sylvia said she told Dr Henderson that Kate still sounded groggy and that she sounded 'slur-ry'.[88] She gave evidence that Dr Henderson said 'that will be the effect of the green stick. Some people, it has a lasting effect'. Dr Henderson gave evidence that Mrs Sylvia never said that Kate was slurring her speech. He accepted that she may have said Kate was groggy, but disagreed that she actually was.[89] Ms Collins also did not consider Kate to have been groggy.[90] He said that if he felt Kate was slurring her speech that would have been an immediate red flag and he would have transferred her to the ED.[91] He said that if he had been made aware that Mrs Sylvia had reported slurred speech to the Operations Centre, then he would not have accepted Kate as a patient and instead had her taken to the ED.[92] This was not because of any policy, but because he would have known that a CT scan would have been required. In respect of the response Mrs Sylvia said he gave, Dr Henderson said that he would never tell someone that speech would be altered because of methoxyflurane because he knows it to be a short-acting drug that would not have had that effect at that time. When specifically asked what he did say in response to Mrs Sylvia telling him that Kate was groggy, he said 'I'm not sure the exact words I said'.[93] I was provided with no alternative response to Mrs Sylvia's query and it is unclear how Dr Henderson dealt with the enquiry, which occurred on his own version, about Kate being groggy.

56 Professor Kelly opined that it would be incorrect to suggest that Kate's slurred speech may have been due to the administration of methoxyflurane. Professor Kelly highlighted that Kate's slurred speech preceded the ambulance's arrival, so could not have any relationship to the administration of medication. Dr Henderson agreed, saying that

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83 T128 and T167
84 T167
85 T421
86 T199
87 T167
88 T34
89 T138
90 T425 and T431
91 T133 and T169
92 T181
93 T172

methoxyflurane is a short-acting drug, but in any event gave evidence that he did not make this comment.

57 Ultimately, whether he did or did not say this was of little relevance. There will almost always be slight variances in accounts from a conversation between two people. The more fundamental issue that arose was Dr Henderson's lack of probing on the issue of Kate's speech when specifically raised by Mrs Sylvia. Professor Kelly said that the rate and manner of speech is something that needed a baseline established by reference to someone who knew Kate's normal speech.[94]

58 Dr Henderson (as well as Ms Collins) placed weight on the improvement in Kate's symptoms over the period of time she was at HASDS. In this case, like in many other cases where there is a missed or delayed diagnosis of a life-threatening condition, the reassurance in the improvement of symptoms after the administration of pain relief (in Kate's case this was Panadol and aspirin), antiemetics and intravenous fluids, is misguided. That simple interventions might achieve some improvement in symptoms does little to progress the process of diagnosis.

59 Mrs Sylvia's evidence was that Dr Henderson then said 'look, statistically people in their 20s and 30s don't have strokes. You just need to take her home, put her in a dark room, leave her there and let her sleep it off'. Mrs Sylvia said she was shocked because she had not turned her mind to it being a stroke.[95] Dr Henderson also had a different recollection of this part of the conversation. He gave evidence that he said:

> ... in a young person with a history of migraine-type headache, migraines were – migraine as the cause of her presentation was likely…[96]

60 He specifically denied saying that young people do not die of strokes and he acknowledged in evidence that young people can die from strokes. Of course, it was not asserted by anyone involved that he had spoken about death. He denied having raised the topic of stroke at all and said that he thought Mrs Sylvia raised it first,[97] notwithstanding that he gave evidence that his assessments were directed toward excluding stroke. He then acknowledged that it might have been him that raised the topic. Given the evidence, it is more probable than not that he did.

61 Mrs Sylvia felt that Dr Henderson had been frustrated that Kate was taking up his time with a migraine. She was certain that he did not believe her assertion that Kate was 'not right'.[98]

62 This was a significant missed opportunity for Dr Henderson to have changed the course of his treatment plan. As Professor Lee opined, when at one end of the spectrum the diagnosis could be dangerous and potentially life-threatening, and at the other is a benign cause and the two cannot be differentiated clinically, it is simply good medicine to take the next step of investigation to rule out the most serious condition. I wholly reject the

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94 T320
95 T35
96 T175
97 T177
98 T42

suggestion that the risk of radiation from a CT scan is prohibitive to this occurring in the context of Kate's symptoms at HASDS.

63 Dr Henderson gave evidence that if he had been aware that Kate was on a contraceptive pill, he would not have assessed the situation differently because the risk of CVST was 2-3 cases in 100,000 people.[99] He later conceded in his evidence that the increased risk could be up to seven times greater for people on a contraceptive pill.[100] He said that while it was a risk factor, it would not amount to a red flag. Upon being questioned about this topic and realising that the information about contraception was contained in the ambulance note which he told the Court he had read, Dr Henderson became visibly upset. This visceral response was telling. It was apparent to me that Dr Henderson realised during his evidence that the medication was a potentially relevant feature of Kate's presentation and that he had overlooked this during his consult.

64 Dr Henderson explained that if he reached the view that a scan was required, he would have called a consultant in the RAH ED and handed over Kate's case, before arranging an ambulance transfer.[101] He said that this was not an infrequent part of HASDS' work and neither was it an onerous task.

65 Dr Henderson gave evidence that he was not aware of any protocol available to him through the Central Adelaide Local Health Network dealing with the assessment of headaches.[102] He said that he had previously looked at Australian and international headache protocols and that they are all formed around the idea of looking for red flags and once there is a red flag, then the next step is to arrange a CT scan.[103] It is concerning that dealing with multiple headache cases, Dr Henderson acted on a vague and general understanding of what might be in a protocol rather than looking at the actual protocol itself.

66 Dr Henderson gave evidence of what was clearly a repetition bias. He said that in the ED many patients dealt with are admitted to hospital with serious pathology, whereas in the general practice setting most patients are discharged home.[104] He was not asked to expand on the role that this repetition bias may have played in his decision-making on the day. Nevertheless, he raised it spontaneously when pressed about his decision to discharge, so it is likely that it played a role.

67 Kate was escorted to the car, with Mrs Sylvia holding one arm and a nurse holding the other. Mrs Sylvia asked Kate why she could not hold the vomit bag properly, with the fingers of her left hand curled up.[105] Kate said that she was experiencing pins and needles. Mrs Sylvia put sunglasses on Kate to deal with the light. Ms Collins could not recall whether Kate was assisted by her mother or walked independently.[106] As she got into the car, Kate vomited again. Mrs Sylvia then returned inside the clinic reporting what had happened. She conceded that she did not advise anyone at this stage that Kate's hand was

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99 T139, T156 and T178
100 T156
101 T137
102 T144
103 T144
104 T134
105 T36
106 T408, T411 and T418

curled up.[107] She explained that she was naïve to what it meant at the time and was no doubt focused on assisting her unwell daughter.

68 A nurse came out with another vomit bag and some wet flannels and visited Kate in the car. The nurse said 'well, you can either just get her home and put her to bed or you can bring her in and wait a bit longer'.[108] This interaction was brief. Mrs Sylvia explained that she had a gut feeling the nurse might get in trouble if they took Kate back in, so they took her home.

69 Ms Collins was advised about what had happened at the car some time later. She gave evidence that it is not unusual for a migraine patient to begin vomiting after feeling better, particularly where they start to move around and get into the light.[109]

70 Following that, Dr Henderson was advised that Kate had vomited in the carpark and was offered to come back in but had elected to go home. He gave evidence that if he had been aware of that while she was still there, he may have performed another physical assessment and if he had concerns, he would have entertained a hospital transfer.[110] He agreed that it is not appropriate to discharge a patient that was still vomiting. He said that he would have liked to have reassessed things if he had been made aware of the difficulty in getting Kate to the car and that she had 'projectile vomited' once she got there.[111]

71 Professor Kelly said that some clinicians would have telephoned the patient when they found out about this event, but other clinicians would not contact the patient on the basis that they had already explained what to do if things did not improve.[112] I understood that to mean Professor Kelly was not critical of Dr Henderson for not contacting Kate when he learnt of the further vomiting as he had set out a plan to reattend.

72 Given the unchallenged evidence that at the very least Mrs Sylvia assisted Kate to her car, and that she projectile vomited once in the car park, I am of the view this was another missed opportunity to have reassessed Kate. To leave the decision to either go back inside the clinic or to go home to a patient and her caregiver is ill advised. When given the choice, it was unsurprising that Mr and Mrs Sylvia and Kate elected to go home. Mrs Sylvia had felt unheard and dismissed. Kate no doubt wanted to be in a dark quiet space and go to sleep.

73 Had Kate been directed to go back inside the clinic for a further assessment, it is likely that the clawed hand would have been detected. Certainly, the further vomiting was cause for concern as Dr Henderson stated in his evidence that he expected a continuous and sustained improvement. If the information from Mrs Sylvia was not enough for Dr Henderson, the continuing vomiting once leaving HASDS should have pushed Kate into the area of requiring further investigations; a scan.

74 I am confident, based on the expert evidence as a whole (which I will detail below), that if Kate had been referred for a CT scan on 2 December 2021, it would have revealed something sinister. While it was unlikely to have revealed a definitive diagnosis for

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[107] T81
[108] T37
[109] T418
[110] T132
[111] T181
[112] T371

CVST, the expert evidence on balance was that an abnormality of some kind would have been detected. The haemorrhage may also have occurred by this time which would have been seen on CT scan. This would have triggered further investigation and given Kate the best opportunity for survival. I will return to this issue later in this Finding.

75 During the drive home, Kate explained to her parents that she thought the paramedics had tried to contact the clinic but got no response and then the RAH accepted her, but then the clinic called back and also accepted her, so she was taken to the clinic.[113] During this conversation, Kate was still groggy, 'like someone's under anaesthetic – like you know like just groggy'.[114] Mrs Sylvia described Kate as 'vague and unfocussed' during the drive.

76 Mr and Mrs Sylvia took Kate to their home and put her in a darkened bedroom. Mrs Sylvia got her some rehydration solution and ibuprofen. She massaged Kate's neck and then left her to sleep. They checked on her later and she was sleeping.[115]

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77 The following morning, Kate was violently unwell. Mrs Sylvia heard her vomiting again and she said she would just take Kate to the hospital herself.[116]

78 Mrs Sylvia did not take Kate to the RAH because, at the time, she was aware that it was dealing with COVID patients. She thought that TQEH was a better choice. Mrs Sylvia also chose not to call an ambulance, preferring to take her by car. Mrs Sylvia explained that she was unimpressed with the care Kate received at HASDS, and Kate had been taken there by ambulance. Based on the events of the day before, and the restrictions and delays imposed by the pandemic, these were entirely understandable decisions. Mrs Sylvia observed Kate's hands were still curled in and she reported feeling pins and needles and numbness in her hand.[117] She was reporting severe pain in her head and was still slurring her speech.[118] She told her mother that she was scared.

79 Mrs Sylvia drove Kate to TQEH and helped her to a bench adjacent to the car park lift. When the lift arrived, Kate got up and walked in the wrong direction. Mrs Sylvia brought her back to the bench and, in doing so, saw a sign that offered wheelchair assistance by phoning a number. She called and then got Kate to the bench by the lift on the ground floor.

80 A porter arrived with a wheelchair and they got Kate into it. As they travelled across to the ED, Mrs Sylvia noticed that Kate's left leg was trembling.[119] Mrs Sylvia asked Kate about it and she mumbled that she did not know why this was happening.

81 Kate was triaged at 12:08 pm by triage nurse Courtney Mills.[120] Ms Mills qualified in nursing in 2013 and spent 10 years at TQEH. Ms Mills took Kate's details and then conducted assessments, culminating in a neurological examination involving pupils, limb

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[113] Exhibit C10 at 5
[114] T39
[115] Exhibit C10 at 5
[116] T41
[117] T43
[118] Exhibit C10 at 5
[119] T44
[120] Exhibit C7 at 33 and T438

strength and grip strength.[121] Ms Mills said that Kate 'seemed lethargic, she seemed like recoiled almost, head down, didn't want to interact much at all'.[122] Ms Mills said that most of the information for the triage came from Mrs Sylvia not Kate. Ms Mills recorded:

> States has been having worsening headache since Wednesday. Was seen at an intermediate care facility yesterday where she had IVT and odansetron [*sic*]. D/c home. This am woke up with worsening symptoms again. PEAL +4 [*sic*], limbs equal. Vomiting.

82 Kate was assigned triage category 3 (with a target timeframe for treatment of 30 minutes) and was allocated to the High Acuity stream. Ms Mills said that she found nothing alarming.[123] She could not recall being made aware of Kate having trembling legs, but said that this might not have been concerning in any event. She recorded the means of arrival as 'wheelchair'. Kate waited in the waiting room and continued to vomit until 12:46 pm when she was taken to a cubicle.[124]

83 Not long after arriving, Mrs Sylvia said that she observed the commencement of a deterioration in Kate's condition. Mrs Sylvia's haunting description was that over the next few hours, Kate was 'gone'.[125]

84 Upon arriving at the cubicle, Kate met nurse Sarah Green. Ms Green qualified in nursing at the start of 2020. Ms Green spoke to Mrs Sylvia who expressed concern that Kate had sought help the day prior and her symptoms had not improved. Ms Green recorded in her notes that Mrs Sylvia had said that Kate was 'shaking in bilateral legs and [had] uncontrollable [left] hand movements and head tilting to the right'.[126] Kate independently transferred from the wheelchair to the hospital bed. Ms Green spoke to Kate about her condition and asked what medications she was on; Kate told her that she had recently started taking a contraceptive pill.[127] Ms Green said that Kate appeared fatigued, but was able to converse properly with no concerns raised about her speech.[128] She was able to speak about working in a library. Once Kate was in bed, Ms Green took a set of vital sign observations and then conducted a neurological examination, including a grip test and holding her arms out.[129]

85 Ms Green said that Kate was able to speak, had her eyes spontaneously open and was able to obey commands during the limb strength tests.[130] Ms Green said that as soon as Kate had finished speaking, her eyes would close again, so she assigned a sedation score of 1. Ms Green identified a left-sided weakness in her leg strength[131] and that her arm kept returning to the same position, on her abdomen. While she had recorded Mrs Sylvia's information that Kate's legs were shaking and her head was tilting, Ms Green did not observe those things herself. Kate reported her pain level as $^{7}/_{10}$. Ms Green spoke to Dr Youseff Peerbaye in the doctors' station. Dr Peerbaye is a consultant physician who qualified in 2001 and has practised at TQEH ED since 2011. Ms Green told Dr Peerbaye

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121 T440 and T469
122 T441
123 T443
124 T446; Exhibit C7a and Exhibit C7 at 5
125 T59
126 Exhibit C7 at 34
127 T481 and T505
128 T481
129 T507
130 T483
131 T483

that she was concerned about a young woman with left-sided weakness and that her mother was concerned.[132]

86 Ms Green said that Dr Peerbaye then saw Kate and ordered medicine, fluids and blood tests. She said that Dr Peerbaye had essentially popped his head into Kate's cubicle and said 'Sarah, can you take bloods?' Dr Peerbaye gave evidence that fluids were appropriate because they would have no negative effect if it turned out that Kate did not have a migraine, but could have helped with pain and hydration. At 1:33 pm, an intravenous fluid infusion was commenced. During this time, Kate's entire arm had started to curl up and a nurse said that it was affecting the drip, so Mrs Sylvia was asked to hold her arm down. Ms Green said she could not specifically remember asking Kate's mother to do that, but it was not uncommon to ask for family help to get a cannula inserted.[133] Mrs Sylvia said that Kate was clutching her head with her right hand and groaning. At 1:36 pm, Ms Green administered prochlorperazine. A sample of blood was sent to pathology at 1:47 pm in accordance with Dr Peerbaye's direction.

87 Notes recorded that at 1:59 pm Dr Peerbaye was informed that Kate had developed weakness in her left extremities and that there was now a half-second delay in responding to commands.

88 Dr Rebecca Duffield became involved in Kate's case. Dr Duffield qualified in medicine in 2018. During her foundational training in the United Kingdom, Dr Duffield had a rotation in stroke medicine. In 2021 she commenced as a resident at TQEH ED under the supervision of the senior doctors. On 3 December 2021, she was completing a shift from 8 am to 6 pm. In respect of medical staffing, the general area had one consultant-level doctor, two resident doctors and an intern doctor. Dr Duffield described that day as busy.[134] She returned from her lunch break and Dr Peerbaye asked her to see Kate before any other patients. Dr Peerbaye said that he wanted Dr Duffield to see Kate instead of the intern doctor, who was much more junior.[135] He gave evidence that he was concerned that Kate might have something else other than a migraine and that he wanted someone he trusted to assess her.[136]

89 Dr Duffield visited Kate at about 2:05 pm or 2:10 pm. She explained that she did not speak to Ms Green beforehand because Dr Peerbaye had asked her to see Kate immediately.[137] She read the triage note, read the vital signs recorded and then went swiftly to see Kate. She may not have read Ms Green's nursing notes. Ms Green recorded a note that Kate was being reviewed by a doctor at 2:16 pm.[138] This was not an unusual wait time to see a doctor at TQEH ED at the time.[139] Dr Duffield recalled there being a disruptive patient near to Kate's cubicle.

90 Dr Duffield said that she immediately realised that Kate looked unwell. She observed Kate to be quite drowsy, but that she was able to explain her condition to Dr Duffield. Kate said that she had a two-to-three day history of headache which she described as one-

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132 T489 and Exhibit C7 at 35
133 T507
134 T542
135 T522 and T548
136 T594
137 T523
138 T492 and Exhibit C7 at 50
139 T567

sided, very severe in nature and quite sudden. She said she had associated neck stiffness, light sensitivity, vomiting, tingling and numbness in both arms and legs. She said that she had been to a clinic the day before. She had previously suffered migraines about every six months, but that 'this felt a lot worse'.[140] Dr Duffield recalled being told that there was some concern about Kate slurring her speech the day before and had experienced poor coordination. Dr Duffield said she was told that there was a history of dyspraxia, but that this was 'very completely off' her baseline.[141] Dr Duffield explained that during her assessment, Kate kept closing her eyes but would open them when she was asked a question. Dr Duffield gave evidence that she recalled observing Kate's speech being slurred at times, but that she was still able to provide the relevant history.[142] There may have been a brief delay in responses. Dr Duffield estimated that her assessment took about half an hour.

91 Dr Duffield found no abnormalities in Kate's general examination (heart sounds, chest and abdomen). In respect of her neurological examination, this encompassed cranial nerves, as well as limb strength and reflexes.[143]

92 Dr Duffield explained that she had found stiffness or rigidity in Kate's left arm and both of her legs which is what she described in her notes as 'tone'. She agreed that this could have been a symptom of an abnormality in the brain or the spinal cord. Dr Duffield said '[t]he thing of concern again in Kate on examination was the coordination which was on both sides in the upper limb, but more pronounced on that left arm'.[144] In respect of sensation, Dr Duffield explained that she could not tell the difference between Kate not feeling stimuli and her simply being too drowsy to do the examination properly.[145]

93 Dr Duffield gave evidence that information provided by Mrs Sylvia during the assessment was 'obviously very useful', although Kate gave most of the history herself.[146]

94 Dr Duffield told the Court that 'something was really quite wrong, but what exactly it was, things weren't fully adding up to me...'.[147] After seeing Kate, she immediately spoke to Dr Peerbaye about her concerns. He was in the doctors' office very near Kate's cubicle.[148] She told him that she was quite worried about Kate and that she thought that something unusual, beyond a migraine, was going on.[149] Dr Duffield said that he suggested an MRI scan because it would show a lesion, evidence of encephalitis or brain oedema, established cerebellar influx or established stroke.[150] Dr Peerbaye gave evidence that he considered a cerebellar event or vasculitides likely which made MRI the preferrable investigation. He said that if Kate had presented in the middle of the night when an MRI would be harder to arrange, he would have ordered a CT scan.[151] At 2:47 pm, Dr Duffield entered an order on the system for an urgent MRI.[152] She then spoke

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[140] T523
[141] T524
[142] T525, T575 and T579
[143] T527
[144] T528
[145] T529
[146] T550
[147] T531
[148] T554
[149] T596
[150] T556
[151] T623
[152] Exhibit C7 at 40

to the on-call radiologist by phone. Following that, she returned to Kate and filled in a safety questionnaire which she then took to the Radiology Department. After that, she commenced writing her notes, which she eventually lodged at 3:19 pm.[153] She recorded the following:

> Visited the rapid access clinic yesterday - was given IV fluids and Stemetil as has a history of migraines
> States these occur once in 6 months
> Reports this is worse than normal migraines
> Well up until yesterday
>
> Increased drowsiness today
> Mum reports slurring of speech and slowing of words when answering the phone to her yesterday - very concerned when saw her so called an ambulance
> Mum noted abnormal flexion of the left arm and abnormal movements of her legs
> States her coordination has been way off today as well
> Walked into ED but required assistance from her mum
>
> …
>
> Cranial nerves:
> Abnormal ocular movements - unable to follow pen - partially due to drowsiness, unable to follow pen horizontally
> Facial sensation intact, Normal power of jaw movements
> Normal facial movements,
> Nil nystagmus
> Hearing grossly intact
> Tongue midline, palate symmetrical, normal phonation, dry mucous membranes
>
> Upper Limb:
> Tone - increased tone in left arm ; normal tone in right arm
> Power - 5/5 power in shoulder, elbow and wrists bilaterally
> Co-ordination - Abnormal co-ordination bilaterally, significantly on the left - past pointing and abnormal flexion at elbow when assessing
> Sensation - difficult to assess due to drowsiness
> Reflexes - hyperreflexia in biceps
>
> Lower Limb:
> Tone - increased tone bilaterally, clonus present in both limbs. Restless legs while resting
> Power - 5/5 in all dermatomes
> Sensation - again difficult to assess
> Reflexes - hyperreflexia knee and ankle, positive babinski reflex

95 Dr Duffield said that while she had not recorded the occasional slurred speech, which she gave evidence she had observed, she had recorded it as drowsiness.[154]

96 Mrs Sylvia said she was likely asked about Kate's medications and that she would not have known the names.[155] She also did not know that Kate was on a contraceptive pill at that time, having learnt this later once at the RAH. Dr Duffield could not recall when giving evidence whether she had been made aware at the time that Kate had been using a contraceptive pill.[156] However, candidly, Dr Duffield said that even if she had been made

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[153] Exhibit C7 at 39-40
[154] T576
[155] T86
[156] T543

aware, given CVST is not a common differential, it may not have crossed her mind initially.[157] She considered that an increased risk may have been drawn out in discussion with a consultant if it had been known. Dr Peerbaye gave evidence that being made aware that Kate had recently commenced taking a contraceptive pill probably would have raised concerns for CVST as a differential diagnosis.[158] He said that it certainly would in his current practice, having been through the experience of Kate's case, but that he could not be sure whether it would have altered his assessment at the time that Kate had presented.[159] Dr Raniga, who will be discussed later, explained that by the time he took over Kate's care, a differential was already being pursued. He said that he would not go back and chase other differentials.[160]

97 Dr Duffield reviewed Kate's blood results. She said there was an elevated C-reactive protein result and white cell count which indicated infection or inflammation.[161]

98 Dr Duffield explained that taking into account Kate's age, that the lower limbs were bilaterally more toned and that she found no weakness differential on any limbs, she thought there was likely an infective or autoimmune cause with encephalitis and meningism considered.[162] She stated that she also considered a lesion in the cerebellum which would account for the coordination issues. She was very sure that there was something neurological going on, but did not feel that the symptoms fit with a stroke diagnosis, although she had not ruled it out.[163] She discussed with Dr Peerbaye the administration of antibiotics in the Acute Medical Unit, specifically ceftriaxone. She spoke with the on-call registrar from the Acute Medical Unit to ensure that Kate was known to them. On their advice, a lumbar puncture and blood cultures were planned to follow the MRI.

99 Ms Green took vital sign observations and neurological assessments at 2:49 pm, with no changes.[164] At 3:15 pm, further observations were taken by another nurse and Ms Green recorded at 3:19 pm 'treating MO aware'. Ms Green explained that this was because Kate's sedation score was now at 2 and she had lost a score on the Glasgow Coma Scale.[165]

100 Dr Vinay Raniga took over as consultant on duty from Dr Peerbaye at 4 pm for the next shift. Dr Raniga qualified in medicine in 1991 and has worked as a consultant at TQEH since 2004. Dr Raniga received a handover from Dr Peerbaye. During that handover, Dr Raniga was advised that a diagnosis of meningoencephalitis was being entertained and that an MRI was being conducted with a lumbar puncture planned upon Kate's return.[166] Dr Raniga said that he was concerned about the case, and in particular the working diagnosis of meningoencephalitis, and so he took responsibility over Kate personally, rather than allowing a junior doctor to take her case. Dr Duffield said that while stroke was a differential at this time, Dr Raniga and her agreed that encephalitis was the more

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157 T542
158 T601
159 T621
160 T675
161 Exhibit C7 at 22 and T535. Professor Szoeke said that she would expect to see a higher C-reactive protein result if there was encephalitis (T768)
162 T532 and T557
163 T557
164 T492 and Exhibit C7 at 50
165 T492 and Exhibit C7 at 51-52
166 T637

likely differential and this would be treated at TQEH.[167] There was therefore no reason to consider transfer to any other facility at this time.

101 Ms Green recorded that Kate had been taken for an MRI at 3:44 pm. The images produced contain timestamps between 4:15 pm and 4:22 pm. In the context of Dr Duffield having ordered the MRI at 2:47 pm, she said that it was 'incredibly prompt'.[168] The specific protocol used was MR brain perfusion, an advanced method. Multiple techniques were used; T2-weighted imaging which is particularly sensitive to stroke, and fluid-attenuated inversion recovery which makes differentiation between cerebrospinal fluid and abnormal pathologies easier to visualise. The scan was conducted in the axial plane. The radiologist was instructed to query encephalitis or whether a lesion was causing the symptoms.

102 Dr Raniga gave evidence that he was pleased Kate was getting an MRI and angiograph, as this is the gold standard of imaging for the brain. Importantly, Dr Raniga went to the imaging area to ensure that the scan was being done in a timely way and that Kate had arrived safely.[169] He said that an abnormality was detected by the technicians and a radiology registrar had been called in. While there, the radiology registrar gave a verbal handover to Dr Raniga with a working diagnosis of an abscess in the brain.[170] Dr Raniga said that he may have briefly looked at the images if they were pointed out to him, but that he relied on the radiology registrar who was specialised in interpreting the images. Following the verbal report, the radiology registrar said he would need to look at the findings in more detail. Dr Raniga explained that he was reliant on the radiologist's expert skills at analysing the abscess seen to diagnose it. He considered that, once a formal diagnosis of right temporal lobe abscess came through, Kate would need neurosurgical input. In the meantime, he intended to keep her observed closely and to monitor her vital signs. Dr Raniga said that in December 2021, it could take three to four hours to get a formal neurological MRI result at TQEH.[171]

103 I pause here to observe the collective efforts of Ms Green, Dr Duffield, Dr Peerbaye and Dr Raniga. What must have seemed excruciatingly slow to Mrs Sylvia at her daughter's bedside was, in fact, a collaborative effort by four concerned health professionals who recognised that something was seriously wrong but were working to identify the underlying cause and direct Kate onto the appropriate pathway of care. All appropriate investigations were taking place, although Dr Raniga did express some frustration with the time it took for the results to be returned, particularly the MRI results.

104 Following Kate's return to the cubicle at 5:15 pm, she was assessed by Dr Duffield and Dr Raniga at 5:20 pm. Dr Raniga made a note of his assessment a short time later.[172] He had conducted a brief neurological assessment. He recorded that he found no nuchal rigidity which he gave evidence meant that there was no meningism. Dr Raniga recorded that Kate was right-hand dominant and that she had left-handed weakness and spasticity.

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[167] T560 and T562
[168] T555
[169] T641 and T659
[170] T640 and T642
[171] T643
[172] Exhibit C7 at 46

105 Dr Duffield said that, given there was something seen on the scan, a sole encephalitis diagnosis was then considered less likely. Dr Raniga gave evidence in agreement. Given there was a space occupying lesion in the brain affecting the intracranial pressure, the lumbar puncture was held to await the formal results of the scan. Dr Raniga said that the lumbar puncture was no longer diagnostically useful.

106 Dr Duffield agreed that at this point a transfer to the RAH was 'almost a certainty', but explained that more information was needed to know which team she should be placed under and that, whatever team that was, they would want to know more detail than was available at that time before accepting Kate as a patient.[173] She said that Dr Raniga had agreed to take care of the transfer once the appropriate team was identified, which is something that consultants often do, as consultant-to-consultant transfers were generally more effective.[174]

107 During that 5:20 pm review, Dr Duffield approved fentanyl being administered for pain relief, given that Kate was spending more time with her eyes closed and was still complaining of pain.[175] Dr Duffield described Kate as 'more persistently drowsy' at this time.[176] Mrs Sylvia was told that an antibiotic was going to be administered in case it was a brain infection. This was administered at 5:37 pm and was in keeping with Dr Duffield's primary differential of encephalitis. Professor Kelly gave evidence that this is usual practice.[177] Kate was administered an antiviral drug at 6:14 pm. At 5:21 pm, another nurse documented that Kate was being reviewed by Dr Raniga and that there was severe weakness in her left arm and leg.[178]

108 When her shift finished at 6 pm, Dr Duffield handed over Kate's care directly to Dr Raniga instead of an oncoming resident doctor which would be the usual course. This was a reflection of how concerned Dr Duffield was about Kate. Dr Duffield told the Court that Kate was one of the more unwell patients she had seen at the time and that was why she had been very worried about her.[179]

109 Mrs Sylvia said that Dr Raniga expressed frustration about the MRI results not being returned yet and Dr Raniga accepted in his evidence that it was possible he did so.[180]

110 While awaiting the MRI results, Kate was also examined by Dr Hank Ly from the Acute Medical Unit.[181] Dr Ly was taking a detailed history when he was interrupted by Dr Raniga with the results from the MRI scan, and Kate remained in the care of the ED.[182] Dr Ly recorded:

> Incomplete examination as ED advised of imaging results (see below) during my examination and stated that they would liaise with neurosurgery and re-refer to AMU if further input required.

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[173] T564
[174] T565
[175] T496, T537, T565 and Exhibit C7 at 7 and 41
[176] T559
[177] T301
[178] Exhibit C7 at 35 and 53
[179] T540
[180] T669
[181] Exhibit C7 at 44
[182] T562

…

MRI brain 3/12/21: Verbal report from ED consultant Dr Raniga who accompanied patient to scan: Appearances consistent with right temporal lobe abscess.

111 The radiologist, Dr Brian Barker, had found a ring enhancing lesion within the right posterior temporal/temporoparietal lobe measuring approximately 25 x 28 mm in the axial plane.[183] Dr Barker recorded his opinion that the lesion was consistent with a haemorrhage/haematoma with blood of varying age. Dr Barker reported that, at that time, the lesion was exerting minimal localised mass effect on surrounding structures. He recorded that there were no indications of the cause visible on the scan. The interpretation of a bleed was only partly correct as will be seen below.

112 Dr Barker phoned the results through to Dr Raniga at 6:55 pm. Dr Raniga said that as soon as he identified a patient with bleeding on the brain, he would speak to the neurosurgical team at the RAH first, because often the stroke team would ask him to do that if he calls them first.[184] That is what he did in Kate's case. The neurosurgical registrar advised Dr Raniga to order a CT angiogram, to provide Kate with an anticonvulsant medication and to phone the stroke team.[185] Dr Raniga then rang the resident doctor in the stroke team, Dr Kate Bailey. Dr Bailey said they would accept Kate as a patient, but that she needed to speak to her consultant, Dr Aaron Tan.

113 At 7:11 pm, nursing notes recorded the decision made to transfer Kate to the RAH due to the now-confirmed (haemorrhagic) stroke. Dr Raniga clarified that there was no clinical indication of ischaemic stroke at that point in time, as the advice given was of a haemorrhage.[186] Dr Raniga said that he could arrange this transfer because he now had a disposition and a unit to admit Kate to. He advised Ms Green. A transfer by ambulance was requested at 7:19 pm[187] and an estimate of 'within the hour' was provided. Dr Raniga said that there was nothing at this time which clinically indicated that a lights and sirens transfer was required.[188] He said a transfer within an hour was 'very reasonable'.[189]

114 At 7:09 pm, Ms Green had taken a further set of vital sign observations which were unchanged. However, upon neurological examination, Kate's left arm and left leg weakness was still severe. A dose of fentanyl was administered at 7:18 pm.

115 Dr Raniga had a discussion with Mrs Sylvia. He told her that the scan had revealed a brain bleed and that it looked like there was an old bleed and a new bleed.[190] He asked whether Kate had hit her head. Mrs Sylvia said that Kate had not reported it and messaged her friends and colleagues to ask. Her colleagues reported back that Kate had been particularly clumsy at work that week but had not hit her head.[191] Mrs Sylvia gave evidence that she would have fully expected Kate to have told her if she had hit her head.

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[183] Exhibit C7 at 12-13 – Original Report
[184] T644 and T698
[185] Exhibit C7 at 46 and T644
[186] T690
[187] Exhibit C8 at 243
[188] T673
[189] T697
[190] T50
[191] Exhibit C10 at 7

116 Before 7:52 pm, Dr Raniga had not heard back from Dr Bailey in the stroke team, so he made another call. Dr Bailey said that she had reviewed the imaging with Dr Tan and that they considered that Kate was not a case of acute stroke and that she should be admitted under the neurology service rather than the stroke unit. Dr Raniga said that there was no discussion about calling a Code Stroke, given that the stroke unit was telling him they would not accept Kate. Dr Raniga explained in evidence that a bleeding stroke cannot be thrombolysed or removed and so that is likely why they would not have accepted her case and why it did not fit within a Code Stroke. He said that acute strokes that cannot be treated in those ways do not require an urgent lights and sirens transfer.[192] Dr Raniga then called the duty emergency physician at the RAH to notify them that Kate was incoming. Dr Raniga said that he remained concerned about Kate, but that she had been stable.

117 Dr Raniga called Dr Michael Hii, the neurology registrar at the RAH. Dr Hii advised Dr Raniga to send Kate to the RAH, order a CT angiogram and that they would then work out where was the best team to admit her under.[193]

118 In the meantime, Dr Barker discussed the results of the MRI with the radiology consultant, Dr Khimseng Tew. Dr Tew reviewed the imaging and agreed that the lesion was in keeping with a haematoma.[194] At 8:20 pm, he lodged an addendum report to Dr Barker's original report. Dr Tew noted that motion artefact, usually a result of patient movement during the scan, had made interpretation difficult.[195] Dr Tew's opinion was that the haematoma was probably subacute to chronic (seven days or more in age) and that the underlying cause was uncertain. Curiously, he recommended a follow-up scan in six weeks.

119 Dr Tew was not initially on the witness list for the Inquest. When evidence arose during the first sitting that questioned the care provided to Kate at TQEH, Dr Tew was asked to provide an affidavit. This affidavit outlined that Dr Tew qualified in medicine in 1994 and had been a consultant radiologist for about 24 years, having worked at TQEH for his whole medical career.[196] Dr Tew's affidavit stated that he was likely on call that day and would have come into hospital to check on Dr Barker's work, which was a usual part of the hospital's processes. The affidavit also revealed that Dr Tew did not report on the existence of a CVST when viewing the images against Dr Barker's report. This was in error.

120 Dr Tew was called to give evidence. He candidly told the Court that when he had reviewed Dr Barker's report, he made two errors. Firstly, he missed the diagnosis of CVST and, secondly, he incorrectly estimated the age of the bleed. He was asked to hypothesise about why he missed the diagnosis of the CVST and he was not able to explain it.[197] He identified where the thrombus was on the MRI slide and in answer to his counsel's question stated that it was characteristic of what a CVST should look like.[198]

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192 T692
193 T648
194 Exhibit C7 at 12 – Addended Report
195 T713
196 Exhibit C17 at [2] and T705
197 T707
198 T708

121 In relation to the age of the haemorrhage, Dr Tew took the Court to the area on the MRI slide where the haemorrhage was. He explained that in relation to the age of the bleed, he had mistaken pure plasma shown in the image for blood cells, which led him to think he was seeing old blood as opposed to the new blood that was actually shown (between 6-72 hours in age).[199] Dr Tew explained that he may have been swayed by the clinical history provided in the referral (history of a three-day headache), as he was not expecting to see anything less than three days old.[200]

122 Dr Tew explained that if he had identified the CVST on the day of Kate's admission, he would have drawn a link between the bleeding and the thrombus and recorded in his report that the intracerebral haemorrhage was probably secondary to the CVST.[201] Accordingly, he would not have merely recommended a follow-up scan in six weeks and it would have been up to a neurosurgical team to manage. I understood Dr Tew to mean that had he identified the CVST on the MRI slides, the action required was more urgent than if a bleed of a number of days in age was reported.

123 Dr Tew came to the realisation that he had missed the CVST in his review of Dr Barker's report when he heard of Kate's transfer to the RAH and reviewed the CT scan that had been undertaken there against the MRI images from TQEH.[202] He did not inform anyone of this mistake at the time.[203]

124 In response to Dr Tew's evidence about what the scan actually showed, Dr Raniga gave evidence that if he had been aware that there was a CVST, he would not have called neurosurgery and would have instead called stroke services and asked for their advice about this rare condition.[204] He said that he would expect that the stroke team would have accepted Kate, but that she still would not have been transferred with lights and sirens as she still did not fit within the Code Stroke criteria.

125 While a correct diagnosis at an earlier stage would have streamlined the referral process undertaken by Dr Raniga, and better prepared the clinicians receiving her at the RAH, I am not satisfied that the reporting error itself materially altered the course of events. Although the ambulance delay compounded the situation, the evidence did not establish that an earlier diagnosis would have resulted in an earlier retrieval in the inevitable absence of a lights and sirens transfer request.

126 By 9 pm, Kate had experienced a decline in her level of consciousness. Ms Green gave evidence that in observations taken at 8:48 pm, Kate had an increased sedation score of 2 and a reduced Glasgow Coma Scale score of 13 because she was now only opening her eyes to pain stimulus.[205] Ms Green spoke to the ED Navigator to advise him that Kate was still waiting for an ambulance.[206] She then spoke to Dr Raniga about Kate's decline.[207] Dr Raniga agreed that the drop in Glasgow score was a concern, but that it

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[199] T714
[200] T715
[201] T717
[202] Exhibit C17 at [13]-[14]
[203] T710
[204] T699
[205] T498 and Exhibit C7 at 56
[206] T500 and Exhibit C7 at 35
[207] T512 and Exhibit C7 at 35

was only a slight deterioration.[208] He said in evidence that he while he did not consider this deterioration warranted a lights and sirens response, he should have made enquiries himself with SAAS to expedite the transfer. In answer to an open question, Dr Raniga expressed the view that this was a missed opportunity to escalate the urgency of Kate's transfer.[209] Later during cross-examination, he repeated this view. Dr Raniga said:

> So, that was my missed opportunity. She wouldn't have qualified for a lights and sirens but I certainly could have escalated with the ambulance with my nursing staff to say, look her GCS has dropped one further point, we have been waiting an hour and 45.[210]

127 I was impressed with Dr Raniga as a witness generally, but particularly the candour that he demonstrated about his clinical care of Kate. I have formed the view that notwithstanding the 'missed opportunity' he identified, the delay in the ambulance transfer was beyond his control and did not materially impact on the outcome. I was reassured in this view by the expert evidence of Professor Kelly who expressed this opinion.[211]

128 At 10:15 pm, a note recorded a conversation between a nurse and Dr Raniga where a lights and sirens transfer was discussed after the ambulance service advised there would be a further delay of a 'few more hours'. The entry reflected that Dr Raniga declined to escalate the transfer and to wait for the ambulance in the normal course. Dr Raniga explained that at the time, Kate's Glasgow Coma Scale score had returned to 14 and that there were no changes to what had been reported to the ambulance service.[212] Dr Raniga said that he would have arranged a lights and sirens transfer where a patient was in danger of death if not transferred within 16 minutes.[213] I remind myself that Dr Raniga was also unaware that Kate was suffering from a CVST as the MRI had been incorrectly reported on.

129 At 10:50 pm, after a further set of observations were taken and there was a drop in the Glasgow Coma Scale score again, Dr Raniga then approved the ambulance service being asked to provide a lights and sirens transfer.[214] Ms Green, who had completed her shift and gone home at 9:15 pm, could not sleep and so she asked the nurse on the next nursing shift for an update on Kate.[215] Ms Green gave evidence that she related to Kate because of their similar ages and circumstances and she empathised with Kate because of how sick she was.[216] It was evident to me during her evidence that Ms Green had been deeply impacted by Kate's presentation at TQEH.

130 A paramedic crew who was at the hospital was assigned to Kate's case at 11:23 pm and arrived at Kate's bedside at 11:30 pm. They prepared her for transport and left the ED at

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[208] T650
[209] T650 and T674
[210] T674
[211] Exhibit C12 at 19
[212] T651
[213] T652
[214] T653
[215] T501
[216] T478-T479

11:54 pm.[217] At this time, Mrs Sylvia said that Kate was barely conscious, unable to hold a conversation and was having spasms all the time.[218]

131 Upon leaving TQEH, Mrs Sylvia asked Mr Sylvia to go home and bring Kate's medications into the RAH.[219] Mrs Sylvia travelled with Kate in the ambulance.

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132 Kate arrived at the RAH triage desk at 12:12 am.[220] She was taken to the resus area. A team of doctors had been awaiting Kate's arrival.[221] Upon examination, it was noted that Kate's pupils initially deviated to the right, but that the issue resolved (ie: the issue was transient).[222] A neurological examination was recorded as follows:

> GCS 11: E3V2-3M6. Obeying in right hand side.
> PEARL 3mm 3mm. Initially deviated to right.
> - Blinks to threat on right. Not convincingly blinking to threat on left.
> Tone
> - Increased tone in LUL and LLL.
> Power difficult to assess given drowsy.
> - RUL able to sustain antigravity.
> - LUL nil antigravity.
> - RLL nil antigravity.
> - LLL nil antigravity.
> Reflexes:
> - Biceps L = R ++++
> - Knee jerk L = R ++++ transmitting to contralateral limb
> - Plantars upgoing bilaterally
> Sensation localising in upper limbs. Difficult to assess.[223]

133 A CT venogram was ordered at 12:34 am and was performed at 12:59 am.[224] The radiologist reported that the haemorrhage was similar in size to what had been shown on the MRI at TQEH. There was an additional small volume adjacent to the haemorrhage and surrounding vasogenic oedema with associated sulcal effacement and effacement of the right lateral ventricle. There was no trans-compartmental herniation. The radiologist identified:

> The right temporal lobe intra-axial acute haemorrhage is stable in volume. Extensive venous thrombosis involving the superior sagittal sinus, right transverse sinus, right sigmoid sinus and right internal jugular vein. Stroke RMO informed at time of scan.[225]

134 A doctor then spoke to Mrs Sylvia. He asked her what medications Kate was on. Mrs Sylvia handed over the pills that Mr Sylvia had collected. This was when Mrs Sylvia first found out that Kate was on a contraceptive pill. The doctor looked at the contraception pill package and said 'it will be that'.

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[217] Exhibit C8 at 243
[218] T58
[219] T58
[220] Exhibit C8 at 225
[221] T57
[222] Exhibit C8 at 230 and 226
[223] Exhibit C8 at 230
[224] Exhibit C8 at 36 and 72
[225] Exhibit C8 at 72

135 Following results of the CT scan, the medical notes recorded:

> Medications
> Antidepressant
> OCP [226]
> …
> Impression: Discussed with Dr Tan
> # Right dural venous sinus thrombosis with right temporal IPH. ?Secondary to OCP. [227]

136 Kate was commenced on heparin anticoagulation therapy and taken to the Intensive Care Unit where she was intubated. A further CT scan conducted and 12:52 pm found progressive intracranial mass effect with additional areas of sulcal hyperdensities likely representing small volume subarachnoid blood product.

137 At around 5 pm Kate underwent a venous thrombectomy. Access was gained through the common femoral vein. Some clot was removed from the distal two-thirds of the superior sagittal sinus, however the more-anterior part could not be accessed. Clot was also removed from the transverse sigmoid sinus with flow reinstated in the left transverse sinus. The conclusion was that outflow had been achieved despite the residual thromboses. A CT brain scan following that procedure found an increasing midline shift. Further interventions were said to depend on an acceptable intracranial pressure and an intracranial pressure monitor was inserted.

138 On the evening of 5 December 2021, Kate underwent a second thrombectomy using a riskier unconventional approach. Bilateral outflow of the transverse sinus was again established. For a brief time after the procedure, Kate had controlled intracranial pressure, however it quickly deteriorated again. A discussion was had with Kate's family about the low chances of successful craniectomy and the likelihood of significant disability, and the family agreed not to pursue that procedure.

139 Kate's intracranial pressure continued to rise until her body became unresponsive and she showed no clinical signs of brainstem activity. She underwent an MRI which found no intracranial blood flow with no uptake in the cerebral cortex or cerebellum. A diagnosis of brain death was made on 6 December 2021 at 9 pm.

140 Kate was on the organ donation register and was able to donate her lungs, heart, liver, pancreas and kidneys.

Cause of death

141 A post-mortem examination was conducted by forensic pathologist, Dr Neil Langlois[228] with separate examination of Kate's brain by Professor Peter Blumbergs from the Adelaide University.[229] The brain was swollen with cerebral cortical venous thrombosis with subarachnoid and intraparenchymal haemorrhages as well as transtentorial herniation of the right cerebral hemisphere. There was compression of the brainstem and

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[226] Oral contraceptive pill
[227] Exhibit C8 at 226-227
[228] Exhibit C1a
[229] Exhibit C4a

necrosis of the cerebellar tonsils. There were recent thromboses in the sagittal and transverse venous sinuses.

142 Taking all the evidence into account, Dr Langlois concluded that Kate's death was as a result of CVST complicated by right intracerebral haemorrhage. There has been no evidence challenging the suggested cause of death. Accordingly, I so find.

Impact

143 It is clear from the evidence of Mrs Sylvia that Kate's loss was devastating. She spoke about having lost her own mother as a teenager and that bringing about a particularly close relationship with Kate; closer to a best friend relationship than a mother-daughter relationship.[230] Mrs Sylvia explained that she worked in a teaching administration role working with medical students and doctors. Her experience in supporting Kate through the medical system brought about episodes of trauma in subsequently dealing with medical students and doctors at work. As a result, she had to give up that work which she had been doing for 17 years.[231]

Assessment of witnesses

144 After the conclusion of the oral evidence but prior to the delivery of closing addresses, counsel who assisted me throughout the Inquest was unable to continue. New counsel assisting took conduct of the Inquest and delivered closing submissions after reviewing the evidence. In those submissions, as is the usual course, submissions were made about the credibility and reliability of the evidence of various witnesses.

145 Counsel for the State made submissions about the appropriateness of counsel assisting, who had not been present in the courtroom during the oral evidence, making submissions about whether certain aspects of witnesses' evidence should be accepted or not. I was urged to take care when reviewing the submissions of counsel assisting.

146 I do not accept the fundamental proposition that counsel assisting could be prohibited from weighing up and assessing witnesses' evidence merely because they were not present while it was given, particularly when the submissions as to weight are made on the basis of the internal logic of the evidence given and how it fits within the overall body of evidence. I do not consider that counsel assisting's submissions are automatically to be afforded less weight on account of that.

147 I do accept that where the submissions of any counsel do not accord with my own assessment of the witnesses, then I am duty bound to make my findings in accordance with the view that I have taken of the evidence. Assessment of witnesses is, in the end, a matter for me to form a view on. While I have considered the helpful submissions made by counsel assisting, I have formed my own view, in accordance with my duty to do so, of all of the evidence presented by the witnesses. While these views mostly align with the submissions made by counsel assisting, this is not the product of assigning improper weight to the submissions of counsel who was not present for the oral evidence, but is instead the result of an independent and impartial approach which I have taken and I have assessed was taken by counsel assisting in his submissions.

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[230] T23
[231] T27

Expert evidence

148 I was assisted by independent evidence from four medical experts. This is an unusually high number of experts to hear in an Inquest. Two were commissioned by the Court in the usual way, as part of the investigation in the process of determining whether an Inquest was necessary or desirable. One expert was commissioned by the State and one by counsel on behalf of the Sylvia family. As each expert has a duty to provide evidence to assist the Court, irrespective of the particular party that commissioned their report, I placed no weight on who actually initially engaged each expert. I considered all of these witnesses to be experts in their fields.

149 There were three neurology experts and one emergency physician expert. I will introduce each expert and provide an overarching explanation of the way in which I will treat their evidence.

Professor Kelly

150 The Court heard from Professor Anne-Maree Kelly. Professor Kelly is a renowned emergency physician who works in Victoria. She qualified in medicine in 1983. In contrast to other experts who gave evidence, Professor Kelly works at the 'coal face' of the ED. She has decades of day-to-day experience in the resourcing available and the bounds of proper decision-making in that environment. Helpfully, Professor Kelly has researched and published articles specifically relating to headache and migraine. In particular, she was the lead researcher in a multinational study on headache presentations to EDs which involved more than 4,000 participants across four continents.[232] Professor Kelly's evidence was well-reasoned, impartial and respectful.

151 As the diagnosis of a CVST by emergency physicians was one of the pivotal issues at Inquest, Professor Kelly's expert evidence assisted in the determination of a large portion of the circumstances leading up to Kate's death. Professor Kelly's specific expertise lies in the identification of clinical symptoms, diagnosis and then pathways to treatment in a high-pressure environment such as the ED. This was the context in which Kate sought treatment on 2 December 2021 and for some of 3 December 2021. I have therefore preferred the evidence of Professor Kelly about such matters where it has directly conflicted with other experts.

Professor Szoeke

152 The Court heard from Professor Cassandra Szoeke. Professor Szoeke is a neurologist. She qualified in medicine in 1999, working at TQEH in the early years of her career.[233] She worked briefly in the ED as an intern. She holds an honorary professorship in the Melbourne University School of Population and Global Health. She did not view the images of Kate's scans.[234]

153 I was greatly assisted by Professor Szoeke's detailed explanation of the pathophysiology of CVST and the way in which the thrombus propagates through the dural venous sinuses. However, I found Professor Szoeke to be rigid in her views at times. While her views were clearly and consistently expressed, I observed that she frequently returned answers

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[232] Exhibit C12 at 1
[233] Exhibit C18 at 4
[234] T765

which merely repeated her fundamental view about the impossibility of preventing Kate's death, rather than engaging with the specific issue being explored by the question. I consider that this was likely an adherence to academic principles at the expense of the practical reality of treating patients such as Kate in the clinical setting, something that Professor Szoeke has less experience of than other experts. Professor Szoeke said that she had only worked in general emergency medicine as an intern and had not worked in a hospital setting at all since 2018. She said that she had only ever encountered CVST in the ED,[235] and so she had limited clinical experience of CVST. While the other expert neurologists agreed with Professor Szoeke that CVST is very rare, and in Kate's case progressed in an unusually rapid way, there were occasions where her opinions were at odds with both Professor Lee and Associate Professor Hand. Accordingly, I have found, in respect of key matters, her evidence was against the weight of the expert opinions available to the Court and could not be preferred where it conflicted.

Associate Professor Lee

154 The Court heard evidence from Associate Professor Andrew Lee. Associate Professor Lee qualified in medicine in 1997. He conducted his three-year neurology residency at TQEH about 20 years ago. He has been appointed a research fellow with the Johns Hopkins University School of Medicine in the United States, within the Department of Cerebrovascular Neurology. His research involved scanning and diagnosing more than 1,000 patients who presented to the ED with acute ischaemic or haemorrhagic stroke.[236]

155 For nine years, Associate Professor Lee was Director of the Flinders Comprehensive Stroke Centre, treating about 700-800 stroke patients a year. He explained that this role was more akin to an emergency physician or intensivist, as he was often arriving to undifferentiated patients in the ED under Code Stroke before any of the ED clinicians had been able to see the patient.[237] During the 'Transforming Health' project, Associate Professor Lee was Deputy Chair of the Stroke Working Group, establishing the current protocols for dealing with stroke in South Australia.[238] While Associate Professor Lee is not an emergency physician, he has clearly conducted much work akin to that of an emergency physician and so his opinion about the care provided by emergency clinicians is of some assistance to the Court.

156 Associate Professor Lee has previously served on the governing board of the Stroke Society of Australia, the Australian Stroke Coalition and is currently the CEO of the Australasian Stroke Academy. He is currently Director of the Centre for Neuroscience Innovation within the Flinders University School of Medicine. He holds a position as Associate Professor in Neurology at the Flinders University School of Medicine. He is currently the chair of the SA State Division of the Royal Australasian College of Physicians and on the editorial board of *Stroke* and the *International Journal of Stroke*.[239] Associate Professor Lee has published dozens of articles relating to stroke, including an

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[235] T761
[236] T813
[237] T814
[238] T816
[239] T814

article in 2004 specifically related to CVST[240] and an article in 2010 relating to CVST from contraceptive pill use.[241]

157 Together with Associate Professor Hand, Associate Professor Lee appeared to be the most qualified neurologist, amongst those who gave evidence, to speak about Kate's condition. He viewed the images of Kate's scans.[242]

158 The State made particular criticisms of the manner in which Associate Professor Lee gave his evidence. They submitted that he had a sense of 'arrogance and grandiosity', that he unnecessarily referred to his training and experience at Johns Hopkins University and that he approached giving evidence 'without due care, glibly, or in a dismissive way'.[243] With respect to the first criticism, I did not consider that Associate Professor Lee presented with arrogance or grandiosity. He certainly expressed confusion about how other experts had viewed the case and maintained that his opinion was preferrable, however in my assessment this did not reach the level contended by the State.

159 In respect of the second criticism, it is true that Associate Professor Lee referred to his time at Johns Hopkins University more than once. However, that must be considered in the context of his overall evidence. He explained that he had spent time there conducting a study where he performed thousands of brain scans of incoming patients. This work is critically relevant to an assessment of his expertise to give an opinion about what one might have expected to have seen if Kate had undergone a brain scan earlier than she did, in light of the symptoms that were reported at various times. Far from being 'unnecessary', I consider that his references to this impressive work was being used as a mechanism to explain why he was able to be so confident about what would have been seen when he was being challenged about his opinion.

160 In respect to the third criticism, I do not agree with the State's submission. Associate Professor Lee appeared to be passionate about his opinion, but not in a manner that causes me doubt about whether he took 'due care' in forming it. I did not consider his evidence to be too generalised so as to discount his credibility or reliability. A specific criticism was made about Associate Professor Lee commenting on Dr Henderson's relative lack of experience when compared to a general practitioner approaching retirement. Associate Professor Lee's assessment of Dr Henderson's experience appears to be quite correct. In any event, as I have touched on above, I considered Professor Kelly better placed to review the care provided by Dr Henderson, given her area of expertise.

Associate Professor Hand

161 The Court heard from Associate Professor Peter Hand. He qualified in medicine in 1991 and completed specialisation training in neurology in 1999. He completed doctoral research in acute stroke at the University of Edinburgh in 2002. He has worked as a consultant neurologist since that time. He has served as Chair of the Neurology Specialist Training Committee of the Royal Australian College of Physicians. He served dual positions as the Co-Head of the Royal Melbourne Hospital's Stroke Care Unit and as Deputy Director of the Royal Melbourne Hospital's Department of Neurology for more

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[240] Exhibit C19a at 6
[241] Exhibit C19a at 7
[242] T824
[243] Written submissions at [296]

than 12 years. In 2020, he was appointed an Adjunct Clinical Associate Professor of the Department of Neuroscience at the Monash University. He also holds an Associate Professorship with the University of Melbourne. Over the years, he has published dozens of scientific articles relating to stroke.[244]

162 For the past seven years, Associate Professor Hand has worked in clinical practice at The Alfred Hospital in Victoria.[245] He is not an emergency physician and has not worked as an emergency physician, but works closely with emergency physicians in the ED.[246]

The consequence of certain assumptions

163 There was a limitation to Associate Professor Hand's evidence. Associate Professor Hand agreed that there were key variances in the evidence of Dr Henderson and Mrs Sylvia.[247] For example, he said that Dr Henderson's evidence that Kate had been walking around the Sefton Park clinic going to the toilet independently was at odds with Mrs Sylvia's evidence that Kate had to be assisted to get to the car. He was instructed by the party that commissioned his report to take as an assumed fact that Dr Henderson's evidence was correct and to disregard Mrs Sylvia's evidence.[248] He was asked to assume that Mr Murchland's care was in line with his evidence. He was not asked to make his own assessment and he was not asked to provide alternative opinions based on alternative versions of events.

164 These assumptions are problematic, particularly given the criticisms made by multiple other experts of Dr Henderson's work and that Mr Murchland could not recall his work at all. The result is that I must naturally be guarded about Associate Professor Hand's conclusions which are not based on the less-partisan factual scenario that I find occurred.

165 Another problematic assumption Associate Professor Hand was asked to make was that Kate's condition improved during her time at Sefton Park HASDS. This assumption is ambiguous because it speaks of Kate's 'condition', but on the evidence heard during the Inquest, it must actually be a reference to the presentation of her symptomology against a background of an evolving and developing condition that never resolved. That is, no allowance has been made for a fluctuating presentation of a developing condition.

166 Associate Professor Hand properly accepted the assumptions he was asked to accept, but to such an extent that he said he specifically did not summarise any factual matters in case it traversed evidence in contrast to the assumptions he had been asked to make.[249] He did summarise factual matters as they related to TQEH.[250] The result was that he accepted Dr Henderson's account as unquestionably correct - quite properly because he was instructed to do. However, this has had an impact on the amount of weight I was able to give to his opinions when I have not found that Dr Henderson's account was unquestionably correct. Given that these assumptions are on fundamental issues, they infect very important parts of Associate Professor Hand's opinions. As occurs in the

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244 Exhibit C20a at 3-7
245 Exhibit C20a at 1
246 T938
247 T994
248 T994 and Exhibit C20 at 4
249 Exhibit C20 at 5
250 Exhibit C20 at 20

ordinary course, if the assumptions an expert is asked to make do not align with the factual findings made, then the opinions on those matters must be discounted.

167 It is unclear why Associate Professor Hand was asked to approach the matter in that way, particularly in light of the fact that most of Mrs Sylvia's evidence of her observations of neurological symptoms such as the clawing of Kate's hand was unchallenged and hence was undisputed.[251] It is particularly unfortunate as Associate Professor Hand would likely have provided more valuable assistance to me if he had been able to base his opinions on a fairer view of the evidence. I say this as I formed the view that Associate Professor Hand was an impressive and measured expert witness.

168 The State submitted that I need not engage with the manner in which Associate Professor Hand was instructed and the assumptions he was asked to make. The State submitted that it is not required in order for me to discharge my 'primary function'. I disagree. I am required to explain the factors that I take into account in reaching conclusions about the evidence and in accepting or otherwise of any expert opinions given. I have expressed that the result of the way in which the State procured Associate Professor Hand's opinion on certain matters was that it could be afforded little weight. That is, it was not based on the facts that I have found occurred. This is an important part of my reasoning process to explain why I reached that conclusion.

169 I agree that it is not for an expert to determine relevant facts. While I also agree that every fact need not be proved in order to afford weight to an expert's opinion, the current opinions do not fall into that category. That is because the facts that Associate Professor Hand was instructed to ignore are critical facts – specific symptoms reported to have been observed and on occasions contemporaneously recorded at the time.

170 While the State submitted that Associate Professor Hand had only been asked to make limited assumptions, his own understanding of what he had been asked to do was greater. He said:

> When I produced my original report I was asked to make assumptions which were not to revise or not to accept the report of Mrs Sylvia.[252]

171 To be clear, I make no criticism of Associate Professor Hand who approached the task of providing an opinion and giving evidence in a very professional and appropriate manner. I also accept that any party is entitled to instruct an expert to provide their opinion on the basis of a specific set of assumptions, so long as they are made clear. I have no criticism of counsel for the State for the act of putting assumptions to an expert. Instead, I merely express disappointment that the way in which this was done resulted in Associate Professor Hand's opinion being based on a set of facts that I cannot find occurred. His particular expertise would have been very useful to my consideration if he had been asked to base his opinion on either a fairer assessment of the critical evidence of symptomology, or even with alternative states of affairs being envisaged (ie. his opinion if what Mrs Sylvia reported had occurred, and alternatively if it had not). It was disappointing to receive his opinion into evidence with the knowledge that he had been specifically asked to disregard an entire critical portion of the evidence which, while always open to dispute, was reflected to some degree in contemporaneous records. This difficulty is compounded

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[251] See *Browne v Dunn* (1893) 6 R 67
[252] T944

by the fact that the very evidence Associate Professor Hand was asked to disregard was subsequently led in oral evidence and was not challenged.

Hindsight bias

172 There were different approaches by the experts to hindsight bias. Some used the principle to ensure that they did not read things into the events that were not there and inserting facts that did not occur on the basis that they must have occurred given the outcome. Other experts appeared to use the principle to say that because certain things had not been recorded by the clinicians, then they had not occurred, were not of significance or were not indicative of any serious illness. An example is the 'clawing' of Kate's hand upon discharge from the Sefton Park HASDS. This was not observed by any clinicians. Some experts said that given this was left-sided it was potentially a focal neurological sign. Other experts said that what Mrs Sylvia observed, if correct, was an unimportant event with unconcerning explanations. This is an improper application of the principle of hindsight bias. I consider it inappropriate to exclude facts so easily merely because they might indicate that the condition was present earlier but not detected.

A rare condition

Expert opinions about the condition

173 The consensus among the expert witnesses was that CVST is a rare condition.

174 Associate Professor Hand gave evidence that CVST is not truly a stroke, but is considered a form of stroke.[253] He said that there is an incidence of CVST of approximately five cases per million people per year.[254] In the 2021 Australian Census, there were 1.39 million people recorded as residing in greater Adelaide. Statistically speaking, the Adelaide health system should therefore expect to see seven cases of CVST each year. Associate Professor Hand said that the condition is more commonly experienced over weeks and months or longer, and acute 'stroke-like' presentations are quite uncommon.[255]

175 Associate Professor Hand said:

> … the brain has a series of venous channels or drains or veins, venous sinuses. A clot will start in one of those sinuses for whatever reason. As that clot is present, the natural tendency of the body is for that clot to propagate or grow. The clot can either dissolve spontaneously by the body, but once it's started, the tendency is for the clot to grow and grow, so it progressively blocks off and as it blocks, it extends along the venous channels … it starts in the transverse sinus, it will extend downwards, it will extend towards the sagittal sinus, it will be progressively larger …
>
> … there's a constant balance in the body between clotting and breakdown of clot if you like, so … the body is constantly in this situation when – if there are little clots forming the body wants to try to breakdown the clots but then the clot may well get to the point where it becomes overwhelmed and then the clotting propagates and keeps getting bigger.[256]

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[253] T937
[254] Exhibit C20 at 6
[255] T987
[256] T1009

176 Professor Szoeke also explained in her evidence what a CVST is. She said:

> Often people talk about stroke, and they lump in all different kinds of pathologies. As neurologists we like to be very specific. If you looked at everything where there's a damage to nerve cells because of an issue with blood flow, and called that stroke, then you would say that a cerebral venous sinus thrombosis is less than 1% of strokes. So it's actually quite a rare occurrence …
>
> With a cerebral venous sinus thrombosis it's really very different to those more common strokes. …. And what this is is in the veins. So blood goes into the brain, and it's … there really to deliver only two things: it's to deliver oxygen and the glucose; and then once it's done that it becomes what we call venous blood, which means blood without oxygen, and with less glucose. Then at this point you have to drain that blood away, otherwise you back up the pressure system. So with the oxygenated blood coming under high pressure, you need to drain away the venous blood to keep the flow going in the system, because it's all one system.
>
> … Venous blood is more likely to clot than arterial blood because it's moving slower. As we all know, we're designed to cut ourselves, and as the blood moves more slowly, we have to clot. And so these are very rare, but when they occur the blood clot stops that flow, it backs up the whole system, it causes pressure in that system, and that pressure presses on the brain. But unlike an ischaemic stroke, which is where you clot off an artery; if you clot off an artery, even a small one, you usually get a specific focal neurology, because whatever that artery was feeding stops working straight away. And with a bleed, wherever the bleed has gone and touched the brain cells, you get a very specific focal neurology for where that blood has damaged the function of the cells. With a cerebral venous sinus thrombosis they are notoriously difficult to diagnose because it's a backup of pressure to the whole system, the whole brain is squashed, and then at some point a part of the brain can bleed.[257]

177 Associate Professor Lee explained that CVST usually starts with something either wrong with a blood vessel, something wrong with the composition of the blood or something wrong with the flow of the blood, which causes a clot to develop.[258] Associate Professor Lee explained that where a person cuts themselves, a clot will form to prevent the person bleeding. He said that in order to stop the clot propagating, or the clot expanding back into the entire venous network, there is a process to counteract the clotting process. He said that where there is a CVST, the clotting and anticlotting processes are working simultaneously. He said that the venous network in the brain tries to bypass the clot which results in dilation of the veins and death.[259] He said that the later that anticoagulation is commenced, the more this process continues and the worse the situation becomes.

178 As set out above, Kate was found to have thromboses in the sagittal sinuses, transverse sinuses and cortical veins. Scientific evidence suggests that amongst those that experience CVST, thromboses occur with the following frequencies:[260]

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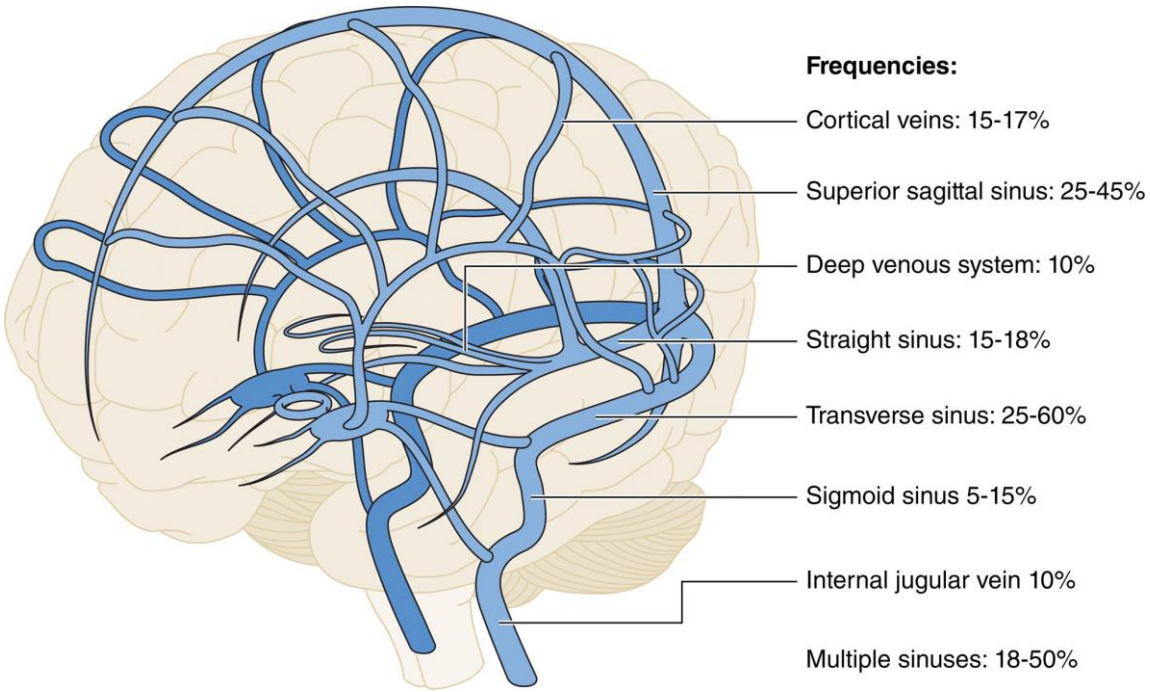
[257] T738
[258] T849
[259] T849
[260] Exhibit C19c at e78



179 Kate's condition fit within the 18-50% of cases where multiple sinuses have thromboses at once. The evidence suggests that 40% of patients also experience haemorrhages.[261]

180 Associate Professor Lee said that the issue with relying on scientific studies is that most venous thromboses arise and then are dealt with by the natural processes which dissolve the clot.[262] He explained there have been no studies which address the specific scenario of where the clotting process is working faster than the clot-control process. Any proposals to study this topic would not receive ethics approval as it involves denying life-saving treatment to patients to see the effect.

181 Professor Szoeke said that women are three times more likely to experience a CVST than men.[263] She said that being pregnant or being on a contraceptive pill were 'prothrombotic states' which also increase the risk. She said that genetic differences and vascular conditions can increase the risk of blood clots. She explained that having a concurrent infection would increase the risk.[264] Associate Professor Lee agreed and pointed to the time before the introduction of oral contraceptives, where the risk of CVST was at a ratio of 1:1 as between females and males. After the introduction of oral contraceptives, the relative risk profile became 7:1.[265] Associate Professor Hand said that this increase made intuitive sense.[266]

182 Professor Kelly agreed that Kate was suffering from a rare condition.[267] She gave evidence that she sees a case about every three to five years in her capacity as an emergency physician.

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[261] Exhibit C19c at e80
[262] T851
[263] T743
[264] T756
[265] T845
[266] T982
[267] Exhibit C12a at 6 and T323

183 Professor Szoeke said that scientific studies suggested that delays in diagnosis of CVST are common.[268] She said that 37% of patients diagnosed had an acute symptom onset (48 hours), 56% of patients had a subacute onset (48 hours to 30 days) and 7% of patients presented with chronic symptoms. She said that the study revealed a median diagnosis time of seven days from symptom onset.

184 Professor Szoeke said that scientific studies show that early identification followed by appropriate treatment, including anticoagulation, along with achieving a reduction of intracranial pressure and neurosurgery, results in a generally good prognosis.[269]

Opinions of those involved

185 Dr Henderson gave evidence that he had never before treated a patient with a CVST.[270] He said that it is a rare condition that is notoriously difficult to diagnose because the symptomology varies significantly depending on the location of the clot. He said that diagnosis is usually incidental upon CT scan, but acknowledged that a CT scan would be ordered where there is headache with 'red flags' which include fever, weight loss, neurological signs, change in character from previous headaches, or an increase in pain when coughing or sneezing (as this increases pressure in the skull). Dr Henderson considered that none of those red flags were present with Kate.

186 Dr Duffield gave evidence that CVST is a rare presentation.[271] While she would have had a lecture on it at university, she had never seen a case of it before treating Kate. She agreed that it was not unheard of, but was fairly rare.[272]

187 Dr Peerbaye said that he had encountered the condition three or four times.[273] Dr Raniga said that he had seen one or two cases in his career.[274] He said that there were neurological lectures at university, but it was unlikely that he had specific training on CVST, although a great deal of time had passed since he studied at university.[275]

188 Dr Raniga said that diagnoses of venous stroke conditions had advanced in the last 10 years. Clinicians are more aware of them than ever and that CT venograms were being ordered more and more.[276] Dr Raniga said that if he treated a young woman who was taking a contraceptive pill, had a headache, nausea, vomiting and abnormal neurology, CVST would be on his differential list.[277]

189 I am not critical in the least of Dr Henderson failing to include a CVST on the differential diagnosis list or even turning his mind to this rare condition specifically. The issue was whether Kate's condition on 2 December 2021 while she was at HASDS warranted something more than Dr Henderson did; namely a scan or a transfer away from this acute care centre to a tertiary hospital. As I have detailed below, I have found it should have.

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[268] Exhibit C18 at 32
[269] Exhibit C18 at 32
[270] T135
[271] T540
[272] T541
[273] T600
[274] T654
[275] T656
[276] T682
[277] T683

Expert opinions on clinically assessing headache

190 As I have touched on above, the assessment of Kate's headache was in the context of an acute care environment and then ED and not in a specialist's office. I have considered all expert witnesses to be experts in their field of medicine, however it was Professor Kelly's specialty that had the most relevant application to the earlier circumstances involving Kate. I have therefore placed more weight on her evidence, particularly in relation to Kate's care at HASDS.

191 Professor Kelly gave the following overview of Kate's case:

> I think that we started off with a severe headache with abnormal speech and not being quite alert in somebody who has herself given the label of having migraines with not a doctor's diagnosis but the lay use of the word and that that has become perpetuated and that people have hooked onto the word 'migraine' and that with each transfer of information people have become more and more locked-on migraine as the diagnosis and have excluded other important information a little bit too early and what would be called in the diagnostic-error-world 'premature closure'.
>
> …
>
> So [Dr Henderson] made a provisional diagnosis of migraine based on what we now know is probably incomplete information that got lost in the system and then he's treated the migraine, there is a response, it's not a complete response it's a partial response, but he then goes 'Well, yeah, it's probably migraine, I'm going to stick with this diagnosis' rather than going back a step … [278]

192 Professor Kelly outlined the following points in her evidence:

a. That in patients who seek emergency care for headache, 7.1% have a serious cause. However, she said that only 3.2% have neurological signs. Therefore, whether a patient has or does not have neurological signs is not a reliable indicator of the seriousness of a headache.[279]

b. That a migraine is a benign form of headache; that is, it will not result in permanent neurological damage.[280] She said that there are a large number of alternative causes of headache, including those that are not benign.

c. That clinicians use the word migraine to describe a specific type of headache; one which is episodic, throbbing in nature, unilateral and may be associated with nausea and aversion to light.[281] By definition, they must last for no less than four hours and no longer than 72 hours. Professor Kelly said that it is only 'very rarely' associated with neurological features. Professor Kelly said that the use of the term migraine is much wider among lay people and that clinicians need to be aware of that and cannot make assumptions that a headache described by a patient as a migraine is actually that, or that it has been properly diagnosed in the past (when assessing a presentation said to be chronic). Professor Kelly said that there should have been caution in accepting that Kate had a diagnosis of migraine where that is not documented.[282]

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[278] T342 and T359
[279] Exhibit C12 at 16
[280] T270
[281] Exhibit C12 at 4
[282] Exhibit C12a at 8

193 Importantly, Professor Kelly opined that migraine is a diagnosis of exclusion. That is, in order to reach a diagnosis of migraine, a clinician will have excluded other conditions. Professor Kelly said that sensitivity to light is not, of itself, significantly discriminatory. She said that the tools used to exclude non-benign causes of headache and reach a diagnosis of migraine depend on the case.[283] She said that a CT scan would usually be helpful. Where there is an infectious cause, blood tests and lumbar puncture will be useful. She said that the aim of assessment is not to exclude every possible cause, it is to consider whether there are any possible serious causes and then to investigate to exclude them.[284]

194 Professor Kelly explained that any abnormality to a patient's speech is a relevant neurological sign, and this could include changes to content, rate or organisation. She said that the concerning features of a headache presentation can fluctuate and can be transient.[285] Professor Kelly opined that a member of the ambulance service speaking to Kate and satisfying themselves that Kate did not have slurred speech should not have diminished from the fact that slurred speech[286] had been reported earlier. She explained that a transient symptom of trouble talking can indicate a temporary disruption to the blood supply to part of the brain and that a report of trouble talking should be taken seriously.[287] Professor Kelly added that the transient trouble talking combined with severe headache, vomiting and photophobia revealed an increased risk of Kate having a serious cause. The persistence of sudden-onset severe pain was of itself a 'red flag'.[288] Professor Kelly pointed to research that showed half of patients' migraines resolve within 24 hours and 75% have resolved by 48 hours. An unusually long duration of headache increases the risk of an alternative diagnosis.[289] Patients suffering the combination of acute and severe headaches are at increased risk of a serious diagnosis.[290]

195 Professor Kelly expressed the opinion that Kate's pain pattern was also not typical.[291]

196 Professor Kelly explained that where a headache patient arrives by ambulance, they have usually called because they are worried about themselves or their ability to drive, which itself is an indicator of a potential serious condition and a greater likelihood of needing scans.[292]

197 Associate Professor Lee's expert evidence on this topic aligned with that of Professor Kelly. He stated:

> … I think the clinical picture that we have before us of a young woman on the oral contraceptive pill with a really bad headache despite the fact - let's assume that she's got migraines, let's assume that she has a monthly migraine - but she's that unwell, for me that is a clinical picture to exclude venous thrombosis which I was taught as an undergraduate.[293]

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[283] T284
[284] T350
[285] T271
[286] The clear import of 'can't talk properly' and 'speaking like a drunk person'
[287] Exhibit C12a at 8
[288] T280
[289] Exhibit C12a at 10
[290] T363
[291] Exhibit C12a at 10
[292] T363
[293] T905

198 Associate Professor Lee said that he was taught in medical school that where a patient presents with a headache and is taking a contraceptive pill, consideration should be given to CVST.[294] He said that he teaches this to his students. He said that doctors are taught certain triggers for considering certain differential diagnoses and this is one of them.

199 Associate Professor Lee disagreed that scanning Kate would have been a waste of resources.[295] He explained that the cost of a CT scan is $233. He observed that, even if you reduce it to a mathematical calculation, Kate's Medicare levy contributions far exceeded that cost.[296] I did not take Associate Professor Lee to be suggesting that such mathematical calculations should be done, but was instead highlighting the fundamental flaw in arguments about the use of resources.

200 Associate Professor Lee told the Court that he does not rely on a patient's historical information. He said that where a patient is referred to him from a GP with a headache, he will take scans unless there have been recent scans.[297] He said that even where a patient attends who has had 'umpteen' prior scans, clinicians must still consider the context within which the patient is presenting.

201 Associate Professor Lee said that if a clinician was concerned about radiation or whether a brain scan was appropriate, they should call and speak to a neurologist. It was suggested to Associate Professor Lee 'we can't scan every person, though, who has a migraine and describes it as worse than it's been before, can we?' Associate Professor Lee responded, 'why not?'[298] He said that is what the international guidelines require and that is what is happening currently and that given that patients are already routinely referred to neurologists having had a scan, this could not be considered to increase radiology workloads.

202 Associate Professor Hand's position was different. Firstly, he disagreed that the location of Kate's pain was atypical for migraine. He said that migraine pain is commonly periorbital, but it can also occur in other areas and varies with different patients.[299]

203 He opined that diagnosis of migraine is based on history and a normal physical examination, that 'brain imaging does not assist in the diagnosis of migraine' and that imaging should not be ordered unless another condition is suspected.[300] He said that scanning patients with headache but without red flags is '… wasteful of resources, exposes patients to a greater risk of radiation exposure than the likelihood of benefit, may pick up incidental abnormalities requiring further investigation, and may miss important abnormalities as the wrong imaging method is chosen or the radiologist is not provided with clinical pointers to assist in their reporting'.[301]

204 In relation to what past imaging he would consider important, he said that it made no difference to him whether a patient's prior normal scan was last week or five years ago.[302]

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[294] T828
[295] T881
[296] T882
[297] T829 and T875
[298] T904
[299] Exhibit C20 at 26
[300] Exhibit C20 at 31
[301] Exhibit C20 at 32
[302] T996

205 Associate Professor Hand stated that Kate's progression from onset of symptoms on 1 December 2021 to death five days later was extremely unusual.[303] He explained that it is rare for a migraine to be triggered by a structural issue such as CVST, but that it can happen, and on the basis of the assumptions he was asked to make about Kate's presentation he considered that to be the case.[304]

206 He considered the challenge in assessing migraine patients was to determine whether the variations in migraine from previous occasions are simply part of the illness, or suggestive of something else.[305] He said that it was 'not reasonable' for clinicians to be required to think about incredibly rare conditions all the time.[306] As I have touched on above, the issue relating to this aspect of Kate's care was not the failure to diagnose a specific rare condition. Rather, it was the failure to recognise the possibility of a serious underlying cause and to take the investigative steps necessary to exclude serious cause.

207 Professor Szoeke said that there were differences in Kate's headache from her prior headaches. In particular, she said that the focal neurology that 'appeared' was new as was the fact that it did not stop and that it was of greater severity.[307] She said that she had only detected these new features after having read 1,500 pages of material, however these new features were not of a nature that such a comprehensive review ought to have been required in order to detect them.

208 Professor Szoeke made an allowance for the difficulty in Kate's diagnosis which she said could have been interpreted as being drowsy and flat with reduced responsiveness due to the intensity of her 'migraine'.[308] Professor Szoeke's opinion on this point does not account for the significant abnormalities observed and reported by Mrs Sylvia which Professor Kelly said should have altered Kate's treatment path.

209 Professor Szoeke stated 'I think the thrombosis was there and causing the headache, but it was the bleed that caused the focal neurology'.[309] She gave evidence that she thought the bleed had commenced later but did not explain what, on that version of events, might have brought about the neurological symptoms observed by Mrs Sylvia earlier, in particular the speech abnormality, the leg tremors, the curling of the hand and arm, and the photophobia. Associate Professor Lee gave evidence that the thrombosis blocked the vein which then exerted pressure in the venous system which caused smaller blood vessels to rupture which was the cause of the haemorrhage.[310] Associate Professor Hand said that CVST can be asymptomatic, but that the more common mild presentation would be persistent headache without any focal neurological signs.[311]

210 Professor Szoeke said that it was not possible to estimate how long it would have taken for Kate's thrombosis to develop to the point when it was found, where it was a size that Professor Szoeke had never seen.[312] She explained that, given Kate had reported

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[303] Exhibit C20 at 33
[304] T946 and T1028
[305] Exhibit C20 at 7
[306] T984
[307] T750
[308] Exhibit C18 at 31
[309] T740
[310] T916
[311] T961
[312] T740

experiencing a headache days prior while at work, it was likely that the thrombosis was developing then. Associate Professor Lee agreed that Kate's condition was towards the severe end of the scale.[313] He said that the physiology tells us that the clot will propagate, therefore Kate would have had a lesser clot on 2 December than 3 December 2021.[314]

'Slurred' speech

Was it reported to Dr Henderson?

211 There was much dispute during the Inquest about whether Mrs Sylvia had reported that Kate had slurred speech. While she did not use the words 'slurred speech' during the triple zero call, that was the clear import of the words that she did use; 'can't talk properly', 'all bleurgh' and 'like a drunk person'. Professor Kelly pointed out that while there are different interpretations open, none of them indicate normality.[315] The call taker recorded 'TROUBLE TALKING' and 'she is not able to talk normally'.[316] The fact that this was the clear import of what Mrs Sylvia was conveying is reinforced by Dr Duffield's later note 'Mum reports slurring of speech'.[317] Further, contemporaneously at 10:38 am on 2 December 2021, Mrs Sylvia sent a text message to her sister-in-law in which she wrote:

> … I called Kate and she's worse than I thought. Slurred speech, vomiting and stabbing pain in head. Hasn't ever been that bad before, so called an ambulance. Better safe than sorry.[318]

212 Whether it was appreciated or not, I find that Mrs Sylvia was reporting slurred speech.

213 Criticism was made of Mrs Sylvia's evidence on the basis that the events were traumatic and that she had said (in her statement) that she had told the ambulance service that Kate had slurred speech, when in fact she had said that Kate 'sounded bleurgh' and that Kate was like a 'drunk person'.[319] I reject such criticism. Mrs Sylvia explained that the effect of the two sentiments was the same. I consider that the concept is so similar that it is unfair to criticise the difference and suggest that it made any difference to the clinicians who were required to assess Kate's presentation. Mrs Sylvia's written statement was made shortly after the events. She summarised her phone conversation as conveying slurred speech and that is precisely what she conveyed when she told them Kate sounded drunk.

214 The criticism of Mrs Sylvia's choice of words was then used to try to establish that Mrs Sylvia did not tell Dr Henderson that Kate was slurring her speech.[320] Of course, Mrs Sylvia's evidence was entirely cogent. That is, upon raising her concern, Dr Henderson explained that the 'green whistle' would have that effect. As I have set out above, Dr Henderson gave no alternative account as to how he responded to the concern of Kate's grogginess. I have no concern in relying on this critical part of Mrs Sylvia's

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313 T858
314 T858
315 T327
316 Exhibit C13 at 1 and 2
317 Exhibit C7 at 39
318 Exhibit C10a
319 T72
320 T72

evidence. The advice given by Dr Henderson might not have been a correct explanation, but that does not mean that he did not say it to deal with Mrs Sylvia's concern.

215 There was also a distinct consistency within the contemporaneous records of Mrs Sylvia's account. In addition to the text message she sent to her sister-in-law describing Kate's speech as slurred, there was an entry in the clinical records by Dr Ly at 6:48 pm on 3 December 2021 at TQEH.[321] In it, Dr Ly recorded that he was unable to get a detailed history from Kate due to confusion and drowsiness, and he recorded the following history obtained from Mrs Sylvia:

> History from mother Kathryn who was present with patient:
> - Prior to Wednesday this week, Kate had been well. No coryzal symptoms.
> - On Wednesday this week Kate messaged Kathryn about a severe headache
> - On Thursday she called Kathryn again about the severe headache. This time it was accompanied by nausea/vomiting, photophobia, ***slurred speech***,[322] and inability to walk properly (was "stuck on the floor"). …
> - This morning Kathryn visited Kate and found that she looked very unwell. Also had involuntary movements of the legs. Kathryn then brought Kate to hospital.
> - During her time in ED: Kate has been complaining of weakness of the left arm and both legs. She was unable to walk into the department: required wheelchair

216 Mrs Sylvia's reports of speech issues were therefore recorded in documents before and after Dr Henderson's involvement and her clear evidence is that she told him as well. His response to that assertion was to dispute that he would have responded in the manner Mrs Sylvia says he did, but without saying how he did respond. I find that Mrs Sylvia raised changes to Kate's speech with Dr Henderson.

Was the report significant?

217 The information from Mrs Sylvia that Kate had a speech disturbance was recorded into SAAS systems, and is reflected on the Background Event Chronology, but was not recorded by the paramedic. Dr Henderson gave evidence that if he had read that, it would have been a major red flag and that Kate would likely have been referred to the ED.[323] During his evidence, Dr Henderson listened to the call that Mrs Sylvia had made to the ambulance service at 9:18 am. He accepted that phrases like 'she can't talk properly' raised concern because it could be equated to slurred speech which would be a red flag.[324]

218 In contrast, Associate Professor Hand said that it was not reasonable to assume that Mrs Sylvia was describing slurred speech.[325] His reasoning was that if the symptom occurred it would have been brief, and it was not observed personally by clinicians. Associate Professor Hand listened to the recording of Kate speaking to the call taker and said that she sounded 'slow and tired', 'obviously unwell' and he agreed that her speech was not normal.[326] His assessment was on the basis of the excerpts of Kate's speech during the call that he could understand. He said that dysarthria is easily confused with other causes.[327] Associate Professor Hand explained that neurology is an art that does not

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321 Exhibit C7 at 44
322 Emphasis added
323 T176
324 T170
325 Exhibit C20 at 27
326 T956 and T975
327 T959

require one sign or event to be picked out and have consequences flowing from it. Of course, he was speaking from the perspective of a neurologist making a clinical diagnosis rather than a paramedic making an assessment of destination or a general practitioner making an assessment of whether a scan might be ordered by an ED. He said '…its value in helping us to reach a diagnosis is fairly minimal if it's a very transient feature'.[328]

219 Associate Professor Hand also said that Mrs Sylvia's opinion about Kate's speech had less clinical weight because she was not physically present with Kate when she heard it.[329] In my view, the fact that the observation was made during a telephone conversation does not lessen its potential clinical significance. A report of altered speech over the phone ought to be treated as seriously as any report observed in person.

220 Professor Kelly disagreed that the report was irrelevant. She said that the fact of the report of abnormal speech should have been taken as a piece of information.[330] It then becomes a case of having a reasonable level of information to conclude that it had not occurred due to a neurological cause. Professor Kelly observed that abnormal speech in the context of severe headache and vomiting were 'shouting neurology' to her.[331] She emphasised that it is not the role of paramedics to reach any conclusion about the abnormal speech reported.

221 Associate Professor Hand said that the task is to distinguish between, on the one hand dysarthria caused by weakness to the muscles around the mouth and tongue, coordination problems, speed problems and on the other hand anatomical factors, psychological influences such as pain, tiredness and intoxication.[332] Associate Professor Lee agreed that abnormal speech can occur for many reasons and that assessment of the cause of the abnormality is required.[333] Associate Professor Hand acknowledged that sometimes it is a difficult distinction and that clinicians should talk to the patient 'or talk to family to get some corroborative history'.

222 Professor Szoeke said that she had no doubt that Kate would have had an abnormality in her speech,[334] but concluded, without having listened to the recording, that there was no focal neurology at play because the speech abnormality would have been due to being 'tired or in pain'.[335] This position pays no genuine regard at all to the evidence of Mrs Sylvia who knew Kate better than any other person and upon which I have placed considerable weight.

223 Professor Szoeke said that her expert opinion was that Kate did not have slurred speech 'because no one else detected that symptom'[336] and that she would not expect it to be transient. Once again, she said that she believed that Kate had altered speech 'because of the horrible headache that she was experiencing and she hadn't slept well overnight'. The only evidence about Kate's sleep is that she said she woke up at 5 am, which on its face suggests she had slept. Professor Szoeke did not explain the basis on which she formed

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328 T960
329 T1033
330 T327
331 T328
332 T957
333 T891
334 T770
335 T770
336 T773

the view that Kate had not slept well, and she did not reconcile her view that Kate had altered speech for innocuous reasons with the fact that no speech alteration was recorded by clinicians at all.

Transience

224 Professor Szoeke's evidence on this topic was at odds with Professor Kelly and Associate Professor Lee; that a speech abnormality arising from the CVST would not have been transient.[337]

225 Associate Professor Hand said that if there was disturbance in the right cerebral hemisphere from a haemorrhage, the signs would be persistent and not transient.[338] He did not discuss a non-haemorrhagic cause of the symptom.

226 Associate Professor Lee gave compelling evidence about transience. He explained that where a thrombus blocks a vein, the vein will back up and build pressure which causes swelling of the brain, irritating neurons, which can result in neurological symptoms that can be transient in the early stages of the disease.[339] He explained that this is because the venous system will use back-up pathways to drain the building blood and before these pathways also become clogged, they will drain blood and alleviate pressure, bringing about a fluctuating situation of pressure with symptoms then relief before the pressure rebuilds.[340]

227 I therefore conclude that, on the balance of probabilities, Kate had an abnormality of speech on 2 December 2021, that it was transient and that it was a symptom of significance.

Assessment of the ambulance service and the use of intermediate care

Mrs Sylvia's call

228 Associate Professor Hand treated Mrs Sylvia's call cautiously, given that she had not been with Kate when the call was made. Further, it was not known how long she had spent with her on the phone.[341] Professor Kelly did not take these factors into account and simply stated that Mrs Sylvia's information should have been taken at face value and seriously. If these were genuine reservations of the call taker, those questions could have been asked of Mrs Sylvia at the time.

229 Professor Kelly observed that there were salient pieces of information during Mrs Sylvia's triple zero call.[342] She said that these included that Kate 'can't talk properly' and that she was 'talking all bleurgh' which implied that Kate's speech was not normal. This included that Kate had never had a headache like this before and that Mrs Sylvia's opinion was that Kate was not completely alert and was speaking like a drunk person. This included that there was a worsening of the headache at 5 am.

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337 T771
338 T960 and T1006
339 T879
340 T880 and T894
341 Exhibit C20 at 9
342 T275

230 Associate Professor Hand said that the information from Mrs Sylvia about Kate's speech would have been useful to Mr Murchland, but that '…objective evidence would, in my mind, be more convincing…'.[343]

231 I have preferred the evidence of Professor Kelly on this topic as her expertise was the most relevant to this aspect of Kate's care.

232 The ambulance service noted all of the important details, assigned a 16 minute response priority and dispatched an ambulance. This was all entirely appropriate.

SAAS call to Kate

233 Associate Professor Hand stated that upon listening to the call, he would not consider Kate's condition to be in keeping with Mrs Sylvia's report that Kate was 'not completely alert' or that she was talking like a drunk person or 'all bleurgh'. He was of the view that Kate sounded lethargic to him, but was not slurring her speech.[344]

234 Associate Professor Hand said that this call was six minutes after Mrs Sylvia's call. Which meant that the episode of speech disturbance was transient and of limited clinical value.[345] He was critical of the significance others had placed on the report of speech abnormality by Mrs Sylvia. He said:

> Experts, in knowledge of the eventual outcome, have looked back and attached great significance to this, and have called it 'slurred' speech and a focal neurological sign that is a red flag … This is hindsight bias and does not reflect the clinical situation at the time.[346]

235 Of course, Associate Professor Hand had been instructed to reject Mrs Sylvia's evidence and was not asked to consider the contemporaneous text message sent by Mrs Sylvia after calling triple zero, in which she specifically recorded that Kate was slurring her speech. He said that Mrs Sylvia's statement that Kate was 'all bleurgh' had no intrinsic meaning. In isolation that may have been true, however Associate Professor Hand did not address whether in that light it ought to have prompted clarification by clinicians, or whether it is more likely that they understood what was meant. He said that the impression Mrs Sylvia formed was not part of her motivation for calling triple zero. He gave evidence that he formed this view of Mrs Sylvia's motivation because she had said during the call when asked why she was calling that Kate had a migraine and was vomiting, only mentioning speech abnormality later in the call.[347] I understand why Associate Professor Hand came to this conclusion but when viewed with the evidence as a whole, it is an incomplete picture.

236 Associate Professor Hand said that clinicians have to 'synthesise all pieces of information' with direct observations of greatest importance. However, Associate Professor Hand's reasoning synthesises all information other than what Mrs Sylvia reported observing which he assigned no weight, in line with his instructions.

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[343] Exhibit C20 at 18
[344] Exhibit C20 at 9
[345] Exhibit C20 at 18
[346] Exhibit C20 at 18
[347] T1000

237 Associate Professor Lee disagreed with Associate Professor Hand's view that the speech disturbance was transient and so of limited clinical value. He said that transient symptoms indicate that something is not right with the brain.[348] He said that as a stroke neurologist any transient symptoms should be taken the same as persistent symptoms.[349] He said that this had been drummed into the neurological community since about 2007 when much research was done into transient ischaemic attack. He said that the transient symptoms that Kate was experiencing on 2 December 2021 might have been the result of raised pressure within the various veins and capillaries causing dysfunction of the neurons or that there was a small haemorrhage.[350]

238 Associate Professor Lee said that Kate's voice, as recorded on the call between herself and the call taker, was abnormal.[351] He said she would be described as dysarthric. He observed that there were bits and pieces of the dialogue where he could not work out what Kate had said while you could hear and understand the call taker clearly. He formed the view, after having heard this call, that Kate was very unwell and should have been taken to a tertiary hospital.[352] He said that the manner in which Kate presented during that call was not sufficient to exclude her as having a neurological symptom[353] and that imaging was required to exclude serious causes before concluding that it had a benign cause.[354]

239 I consider that it was appropriate for the call taker to speak to Kate directly and satisfy herself of the true position. Given that an ambulance was already en route at that point, it was appropriate to record the call taker's personal view into the dispatch system, however clinicians should not allow that advice to detract from the seriousness of the original report.

The decision to pursue intermediate care

240 There was a considerable volume of evidence on the issue of whether Kate was displaying neurological symptoms on 2 December 2021 at the intermediate care facility. However, taking the analysis back a step, it was the view of Professor Kelly and Associate Professor Lee that Kate should not have been taken there (or accepted) in the first place.

241 Importantly Professor Kelly said that it was not appropriate for intermediate care facilities to treat ambulance patients with headache.[355] She explained:

> In my opinion, the report of inability to speak normally by someone that knows the patient, even if transient, should raise suspicion of serious pathology (such as stroke, etc) and necessitate transfer to an appropriate ED.[356]

242 Professor Kelly's opinion was that the information provided by Mrs Sylvia should have been provided to the Health Navigator, in particular that she was not fully alert, that she was not speaking normally and that this headache had differences to previous

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348 T878
349 T876
350 T878
351 T834 and T873
352 T844 and T874
353 T896
354 T897
355 Exhibit C12a at 7
356 Exhibit C12 at 13

headaches.[357] Given it was important information, this would have been preferrable rather than assuming the Health Navigator had read it herself in the tasking notes.[358] Professor Kelly's expectation was that those three factors alone would have changed the Health Navigator's view from 'not sure' about whether intermediate care would accept Kate to being very sure that Kate should be taken to hospital.[359]

243 Professor Kelly's opinion was that the decision to transfer Kate to the Sefton Park HASDS was not appropriate.[360] She explained that the inclusion criteria for HASDS do not include acute severe headache and specifically exclude 'neurological signs'. Given that Mrs Sylvia had reported abnormal speech, Kate should have been excluded from HASDS, even if that abnormal speech was transient or was not strictly described as 'slurred'.[361] Professor Kelly explained that speech abnormality is what counts as a red flag, not slurred speech specifically. Professor Kelly said that the information available to Mr Murchland through the MDT was sufficient for him not to take Kate to Sefton Park.[362] Professor Kelly said that, even if a CT scan was available via taxi transport, it was not appropriate to take Kate to HASDS.[363]

244 Associate Professor Lee's opinion was also that Kate should have been taken to a tertiary hospital, given that Mrs Sylvia had reported red flags to the ambulance service, including the inability to speak and a reduced sensorium.[364] He said that even if Kate had been taken to the Sefton Park HASDS, she should have immediately been referred to a tertiary hospital.[365] He said he would expect this to be done by any primary care physician. He observed that Kate fit within the exclusion criteria for the service set out in its own published fact sheets, which exclude persistent headache.[366]

245 Associate Professor Lee observed that where the person making the decision about where to transport a patient to is not a trained doctor, then they need to err on the side of caution and consider the worst case scenario.[367] He explained that clinicians need to recognise the limitations of their clinical capabilities.[368] He said that he would use Kate's case as a teaching example of why sensitivity is needed in assessing transport to intermediate care.

246 Associate Professor Hand disagreed. He said that there were no 'red flags or concerning signs that indicated the presence of another sinister process', again noting that he had been instructed to disregard Mrs Sylvia's evidence.[369] Associate Professor Hand said that the most likely diagnosis at that time was migraine, and that it was 'completely appropriate' for a paramedic to make that diagnosis. When he was asked to specifically address Mrs Sylvia's evidence in his evidence, Associate Professor Hand said that Mrs Sylvia's description of Kate being 'all bleurgh' was not helpful.[370] He did not address

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357 T289
358 T340
359 T289
360 Exhibit C12 at 17
361 Exhibit C12 at 17 and T304
362 T340
363 T337
364 Exhibit C19 at 2 and 6
365 Exhibit C19 at 3
366 Exhibit C19 at 4
367 T893
368 T894
369 Exhibit C20 at 11, 24 and 28
370 Exhibit C20 at 25

whether these 'unhelpful' descriptions should have been explored with further questioning of Mrs Sylvia. In any event, Associate Professor Hand then concluded that the Sefton Park HASDS was an appropriate facility to take her to.[371] He placed weight on his understanding of her symptoms, that it '…sounds like a unilateral throbbing or stabbing headache that's at least of moderate severity, that's occurred in the past, that's been investigated in the past…'.[372] Of course, there is no evidence that Kate had been subject to any prior investigations of headache.

247 It was likely that there were two issues at play in the decision to use intermediate care. The first was the complicated transmission of information between those involved in Kate's care, which resulted in the loss of important reported symptoms. The second was the weight, or lack of weight, given to Mrs Sylvia's reports.

248 A key event which guided the course of events was Mr Murchland filtering the information that Mrs Sylvia had detected abnormal speech. Mr Murchland was the last clinician to be advised of this and he excluded it from his notes on the basis that he did not detect it himself. That was not appropriate and this very important fact should have been recorded as part of the history on his notes and in his handover. This important fact had the capacity to change the impression others formed of the case.

249 In the end, Professor Kelly's opinion was that, given the significant possibility of serious pathology, patients with acute headache who call an ambulance should be taken to hospital, even if they are neurologically normal.[373] She said that 'acute' in this context means a headache that has come on either very suddenly or has got worse very suddenly. She said that where the category of patients has at least a 50/50 chance of needing a scan, it does not make sense to send them to a facility that cannot conduct a scan.[374] She said that EDs having less time available per patient is not a reason not to send patients there who need it.[375]

250 Whether Kate's case fit within the inclusion or exclusion criteria at the time is less important than that Kate should simply not have been taken to the Sefton Park HASDS or, if she was, she should have been directed to hospital for a scan.

251 I have accepted Professor Kelly's evidence and find that this was a significant missed opportunity to have changed the course of Kate's treatment, at a time early enough to have provided her with the best chance of survival.

252 Kate's family made a submission that the government should be encouraged not to put pressure on intermediate care facilities to accept patients in order to relieve ramping. While I observe that intermediate care facilities are publicised to be part of the government's response to ramping and they do have the ability to relieve the burden on EDs, I heard no evidence that there is a widespread misuse of those facilities. While I have found that Kate should not have been taken to the intermediate care facility (or moved on quickly from there to a facility with scanning capabilities), that is a finding that falls short of the bigger systemic issue referred to by the Sylvia family.

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371 Exhibit C20 at 11
372 T951
373 Exhibit C12 at 19 and T363
374 T309
375 T366

253 I am of the view that the error here was not the existence of the alternative care facility, rather the failure to place enough weight on a report of concerning symptoms and the loss of vital information in the communication processes.

Handover

254 Professor Kelly explained that it is really important for clinicians to hand over anything that might be relevant, as unfiltered as possible.[376] Professor Kelly said that Mr Murchland should have handed over to HASDS' staff that Mrs Sylvia had called the ambulance because she was concerned that Kate was talking like a drunk person. Professor Kelly said that this information takes seconds to say, but heightens the recipient's awareness of potential risk factors.[377] Importantly, she explained that it is not the paramedics' role to reach a diagnosis and that there is no obligation for a handover to be ultra-brief. Her opinion was that if you are not the clinician responsible for making a diagnosis, then you can be blocking important information from the person making that assessment, which can have the result of pushing them towards a particular diagnosis.[378] Professor Kelly said that information about what had been reported but not personally observed by paramedics was 'all very relevant'.[379] She disagreed with an assertion that reporting all of the information had the capacity to confuse ED clinicians and stated that having that background would in fact assist her. Professor Kelly stated that research has shown 'over and over and over again' that the most important part of a clinical encounter is the history of the illness.[380] The history is important, together with the examination and then the next contribution to diagnosis, being investigations.[381]

255 In addition, Mr Murchland was aware that Kate had recently commenced use of a contraceptive pill and did not hand that over. I accept the evidence of Professor Kelly and other experts that this is a risk factor which should form part of the background information. The evidence did not establish strongly that this knowledge would have made any significant change to the approach taken and so, while I find that it should have been handed over, I do not consider this aspect to have been an opportunity to prevent Kate's death. Mr Murchland also recorded the contraceptive medication on the PCR provided to the HASDS, which was unfortunately not noted by Dr Henderson.

256 In light of that analysis, I find that Mr Murchland's handover was only deficient to the extent that there had been a report from a family member of a speech disturbance which was not passed on.

257 I heard much evidence and submissions about the potential causes for the speech disturbance detected by Mrs Sylvia. The underlying physiological cause of the speech abnormality is less important than that there was an abnormality identified. The existence of the abnormality, from any cause, would have been a 'red flag' and would likely have seen Kate's referral to hospital where a scan was more likely to have occurred given the relative ease and availability of that service in a tertiary facility. As I have touched on above, I find that this should have occurred.

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376 T281
377 T282
378 T342
379 T330
380 T330
381 T341

Assessment of the care at the Sefton Park HASDS

Dr Henderson's assessment

258 Dr Henderson's oral evidence was effectively that he conducted a detailed and comprehensive assessment of Kate and detected no neurological abnormalities. Read objectively, his evidence about his examinations sounded more like a lecture on the gold standard of examinations rather than having the sound of the recital of an actual memory of what he had done. Given that he did not record any of it, only a global summary of three words, it is difficult for me to accept that his assessment was text-book precise, particularly in a busy clinic. This was specifically in light of the fact that his evidence was given following criticism in multiple expert reports about his failure to document his examinations and speculation that he had not conducted a thorough examination.[382] This was one aspect of the circumstances leading up to Kate's death about which all experts agreed.

259 I was also surprised by the very detailed neurological examination that Dr Henderson described in his oral evidence when compared with his brief contemporaneous note.

260 Looking at the clinical entry in isolation, Professor Kelly observed that Dr Henderson's history and examination was very brief and lacking in detail. Key features, such as the onset and progression of the headache, as well as photophobia, were not documented.[383] She pointed out that Dr Henderson's examination was bookended by reports from Mr Murchland and Mrs Sylvia that Kate had photophobia, therefore it is likely that she had it in the middle as well.[384] She said that what Dr Henderson had described should have been recorded as mild photophobia, that the character of the headache was not recorded and that there were two prior medical conditions recorded, but no record of medications.[385]

261 Professor Kelly's critique of Dr Henderson's notes must be viewed in light of her experience; having examined hundreds or thousands of sets of medical notes for forensic purposes and therefore having great familiarity with the usual standard.[386]

262 Then when compared to his oral evidence, the language Dr Henderson used left me with a sense of unease as it was at odds with what he was attempting to assert. By way of example, he used language such as 'it begins with', '… that's felt by holding the hand', '… right side is compared to left' and 'so, all of these reflexes are elicited'. I asked him to explain his use of language and he said he was referring to what 'we would' do.[387] That was particularly telling and fit with my impression that he was describing what he could have done, or what he thought he ought to have done, rather than reciting factually what he did do.

263 Issues were raised that Kate suffered from developmental dyspraxia which caused her clumsiness and that she had been assessed as having a slightly disordered gait. It was suggested that if Dr Henderson's assessment was as comprehensive as he indicated in his

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382 For example Exhibit C12, Exhibit C12a and Exhibit C20
383 Exhibit C12 at 18
384 T352
385 T347
386 T799
387 T110

evidence, it would not have been possible to find quite literally nothing worthy of note. What was of more interest to me was the fact that Dr Henderson described having observed Kate walking to the bathroom and that this led him to record the note 'ambulating independently'. He said that this was in the early afternoon, some time after he had concluded his neurological assessment, and that he was coming out of another patient's room at the time. He had earlier given evidence that he had asked Kate to walk as part of his comprehensive neurological assessment. It strikes me as unusual that Dr Henderson would separately record a single component of the neurological assessment when no other aspects were separated out. If Kate had walked as part of the neurological assessment and recording 'neurology grossly intact' covered every aspect of neurology, then what did it add to separately record 'ambulating independently' after observing this later. Logically, this would only be separately noteworthy if it had not been observed earlier – that is, if she had in fact not been asked to walk as part of the neurological assessment. I find, on the balance of probabilities and weighing in *Briginshaw* considerations, that Dr Henderson did not ask Kate to walk during the neurological assessment. This exacerbates my view that he had not described in his evidence what he had actually done.

264 In addition, Associate Professor Hand explained that the neurological examination that Dr Henderson gave evidence he had conducted was beyond that which a neurologist would conduct.[388] He said that it was more exhaustive than he would conduct over an hour in his rooms with a new patient (who are rarely in severe pain).[389] Professor Kelly agreed.[390]

265 Professor Kelly said that in the emergency context, she had never seen a neurological examination as described by Dr Henderson in his oral evidence.[391] Professor Kelly stated that more detail was required in the notes, but not necessarily a full nerve-by-nerve summary. She opined that it was important to record abnormal findings, but it was also important to record normal findings, particularly where a clinician was not going to do further tests or assessments.[392]

266 Dr Henderson gave evidence that 'grossly' means '… completely, entirely intact'. Professor Kelly said that when the words 'grossly intact' are recorded, it usually suggests that a screening examination had been conducted. She said that in emergency medicine practice, the word 'grossly' is not used to mean 'completely'.[393] She said that usually further examinations are then conducted only if something abnormal is detected on the screening tests.[394]

267 Associate Professor Lee was of the view that there was a disconnect between the description Dr Henderson gave in evidence and his documentation.[395] Firstly, he described Dr Henderson's record as 'notably brief'.[396] In addition to that he observed that 'grossly intact' suggested that from a very macroscopic point of view, everything looked

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388 Exhibit C20 at 13 and T285
389 Exhibit C20 at 12-13
390 Exhibit C12a at 6
391 T314
392 T348
393 T347
394 T313
395 T837
396 Exhibit C19 at 6

fine. He said that is what those words would convey to anyone with a medical qualification. He observed that Dr Henderson's notes were inadequate for a 30-minute consultation.[397] He said that the quality of medical notes should not vary between a general practitioner and neurologists who are taught the same in regards to note taking as are all other medical practitioners.[398]

268 I do not accept that Dr Henderson used the language 'grossly' in the context of a three-word summary to reflect an extremely comprehensive assessment. That is not the ordinary sense of the word used in that context and is not what other trained professionals understand it to mean. I find that if Dr Henderson had done an assessment as comprehensively as he described in his evidence, he would naturally have recorded more detail, even if only slightly more than 'grossly intact'.

269 Associate Professor Hand agreed that it would have been preferrable for Dr Henderson to record in more detail about what his neurological examination involved.[399]

270 Professor Szoeke said that there was no documentation to indicate whether tests for neglect, sensory change and dysdiadochokinesis were performed.[400] She was, however, willing to place confidence in the minimal notes recorded, even prior to Dr Henderson providing any evidence at all in these proceedings. Her approach was incredibly generous. She gave weight to the fact that Dr Henderson is a general practitioner and not a specialist.[401]

271 Dr Henderson gave evidence that he asked Kate about her medications and that she did not disclose to him that she was taking a contraceptive pill. He made no notes of any medications that she was taking. She had disclosed to the paramedics that she was taking that medication. I find myself unable to accept Dr Henderson's evidence on this topic. In any event, Dr Henderson agreed that he had read the paramedic's notes and so even on his own account he was put on notice that she was taking that medication from that source.

272 Professor Kelly explained that the use of contraceptive pills increases the risk of thromboses of all kinds. She said that, notwithstanding widespread use of contraceptive pills, CVST is a rare condition. For that reason, she would not expect the use of a contraceptive pill *alone* to be a red flag. Professor Kelly was of the opinion that the use of a contraceptive pill was a lesser issue than the threshold evidence that otherwise existed which indicated a scan was required.[402]

273 Dr Henderson gave no evidence of any attempt to contact the neurologist who had previously investigated Kate's headaches. If this had been done, it might have brought about a realisation of the true situation that there was no neurologist. If Dr Henderson had probed more into Kate's story, he might have uncovered one simple fact which changed the entire case – that Kate had never been formally diagnosed with migraine. If that was revealed, then Kate's presentation became not one of a migraine like others experienced before and cleared from concern, but an undifferentiated headache that required investigation. A more in-depth examination might have revealed neurological

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397 T876
398 T901
399 T991
400 Exhibit C18 at 29
401 Exhibit C18a at 14
402 T317

features, such as Kate's left hand clawing up which was observed only a short time later by Mrs Sylvia.

274 Associate Professor Hand did not wish to comment on Dr Henderson's performance in taking Kate's medical history as he considered this unfair.[403] He said that if a CT brain scan had been done years earlier and was normal, it would have been reassuring.[404] He did not address his consideration of the fact that Dr Henderson made no attempts to explore what the earlier scan was and what it showed, nor how he considered the evidence that Mrs Sylvia told Dr Henderson that there was no diagnosis of migraine.

275 Associate Professor Lee opined that a proper neurological evaluation would have revealed an abnormality at the time that Dr Henderson conducted it.[405] He reasoned that there are two possible scenarios; first, that Kate was suffering only from a migraine at this point or second that she had sustained the CVST at this point. On the first scenario, Associate Professor Lee said that a proper neurological evaluation could have been normal. However, he said that it is not possible for Kate to have been found in the condition she was the following day without it having been present the day before. Therefore the second scenario was the more likely one. Associate Professor Lee said:

> Based upon what were the evidence of that point in time, so in other words, her speech was abnormal, she was unwell and vomiting, she had dystonic posturing described, so just on that alone I cannot fathom how a neurological evaluation could be normal. I also say that would be based upon what I would expect from [a junior doctor],…one of the people that might work for me at the Calvary, I'd expect them to say 'Dr Lee, I don't know what's quite wrong or I can't describe it, but there is something not right about this neuro examination'.
> …
> … you have evidence already of a dysfunctioning hand. You have evidence of a person who has a catastrophic progression 24 hours later. You have no evidence of any unusual factors within the pathology [at post-mortem] that would account for that. … The hand [clawing] was later in the day, nevertheless the signs would still be there. I cannot reconcile how the scenarios that how it played out could have a perfectly normal physical examination.[406]

276 This reasoning is distinct from hindsight bias. It is not suggesting that something that was not present should have been observed because of the known outcome. Instead, Associate Professor Lee pointed to specific symptoms that were observed on that day and reflected on the quick progression of the illness to conclude that those symptoms would have been detectable. This is in the context of the doubt expressed over the thorough examination Dr Henderson said he conducted. This is different than a conclusion that something should have been detected because of the known outcome when there is no evidence of signs of it at the time.

277 Professor Kelly agreed that it was possible for Kate to have returned either normal or abnormal neurological examination results when assessed by Dr Henderson because there was sufficient time for Kate's condition to progress before she was later scanned.[407]

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[403] Exhibit C20 at 12
[404] T993
[405] Exhibit C19 at 3, T843, T876 and T900
[406] T876 and T901
[407] T311 and T315

However, she said that on what was known to Dr Henderson, he should not have reached a diagnosis of migraine.[408]

278 I have considered the operation of the *Briginshaw* principle[409] in the context of the totality of the evidence presented during Inquest. I accept that a finding that Dr Henderson did not perform the medical examination and assessment he gave evidence about is a significant finding and requires strong evidence to support it.

279 However, in light of all of the evidence combined, I consider that the true state of affairs is plain. It is particularly significant that Dr Henderson did not ask Kate to walk during his neurological assessment. That is, this was an important component of Dr Henderson's text-book-like examination which he described doing that he had not actually done during the examination. The combination of that together with the failure to record any detail whatsoever, the language he used when describing the examination, and that experts themselves would not conduct assessments to that level of detail, leads me strongly to the conclusion that Dr Henderson did not perform a neurological examination as detailed and thorough as he described in his evidence. Whatever the precise nature of the examination undertaken, more was required to be certain that all neurological features had been excluded. This was an opportunity to detect the seriousness of the situation early and to change the course of Kate's journey in the health system.

Diagnosis

280 Professor Kelly opined that Dr Henderson under-appreciated the pattern of Kate's headache; that it had a sudden change to more severe and associated with severe nausea, vomiting and photophobia.[410]

281 Professor Kelly explained that the fact that Kate had never before required emergency level care for her headaches, and that she reported it as more severe and disabling, meant that it was different from her usual headache.[411] She said that any difference at all would cause her concern. Professor Kelly said that Kate was not on migraine prevention treatment which suggested that she did not have a formal diagnosis of migraine.[412] Associate Professor Hand disagreed that this fact carried weight, as he said that migraine prevention therapy is generally reserved for patients with weekly or fortnightly migraines.[413] He said that red flags do not exist in binary form and that an assessment needs to be made and that a headache persisting for less than 24 hours is not a red flag.[414] Of course, whether correct or not, Dr Henderson recorded a history of headache for the 'past few days' so Associate Professor Hand's opinion about Dr Henderson's diagnosis is not based on the evidence.[415]

282 Professor Kelly stated that Dr Henderson's note 'headache for past few days, very severe today'[416] was not suggestive of migraine, which is by definition less than 72 hours'

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408 T362
409 See *Briginshaw v Briginshaw* (1938) 60 CLR 336
410 Exhibit C12a at 10
411 Exhibit C12 at 17 and T285
412 T285
413 Exhibit C20 at 26
414 T977
415 Exhibit C6 at 12
416 Exhibit C6 at 12

duration.[417] She was of the view that his entry recording the migraine to be right unilateral occipital was unusual for migraine. Professor Kelly said that, given that migraine is a diagnosis of exclusion, there was not sufficient evidence to assume that Kate had a migraine.[418]

283 Professor Szoeke expressed the opinion that there was contemporaneous collateral information which supported Dr Henderson's view that this was Kate's usual headache, but of course the information Professor Szoeke referred to was not information that was ever shared with Dr Henderson,[419] and it was flawed in the sense that it did not properly engage with the clear differences and placed reliance on the assumption of formal diagnosis.

284 Associate Professor Hand was of the view that Kate's clinical features satisfied the International Classification of Headache Disorders criteria for migraine with aura.[420] However, that conclusion depended on acceptance of Dr Henderson's account of Kate's presentation and assessment.

285 Professor Kelly explained that, even if Dr Henderson had conducted the exhaustive neurological examination he said he had, it would not be sufficient to rule out a non-benign cause of Kate's headache, given the history reported.[421] She said that Dr Henderson's diagnosis of migraine was not soundly made and that his diagnosis should have been 'severe headache for investigation'.[422] Professor Kelly explained that the fact there is a response to treatment is not diagnostic of migraine and does not exclude a serious cause for headache.[423] Associate Professor Hand agreed.[424] He said that a good response was consistent with migraine, but not diagnostic.

286 Associate Professor Lee agreed that a brain scan is the standard of care required for diagnosis of a patient with a severe headache with an abnormal neurological picture, which he observed in Kate's case included a report of abnormal speech.[425] He also raised the risk factor of the use of a contraceptive pill.

287 As Professor Kelly highlighted, it was likely that Dr Henderson was also affected by an anchoring bias. That is, he was told early in his dealings with Kate that she had a migraine like she had had previously. This appeared to have guided what he did subsequently; anchored to the idea that this was a simple migraine. Associate Professor Hand said that there was no anchoring bias and amongst his reasoning for that opinion he listed '… the fact that it's recurrent, the fact that it has been there for some years, the fact that there has been previous investigations'.[426] He said 'both the ambulance officer and the Sefton Park doctor confirmed in their minds the diagnosis of migraine that had been said by the patient…'.[427] He did not explain on what basis he considered that prior diagnosis to have been confirmed.

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417 T346
418 T285
419 T752
420 Exhibit C20 at 14
421 T286
422 T349 and T356
423 Exhibit C12a at 7 and T349
424 Exhibit C20 at 14
425 Exhibit C19 at 3
426 T972
427 T973

288 Professor Szoeke concluded that there was no focal neurology to be found at the time of Dr Henderson's assessment.[428] However, she did not engage with the observations of Mrs Sylvia which were not in dispute. Instead, she appeared to have reasoned that because Dr Henderson said he found none, then there were none.

289 Dr Henderson said that, in retrospect, it would have been helpful to have conducted a further neurological assessment.[429] Dr Henderson agreed that Kate would have experienced an improvement in her symptoms due to having had analgesia, antiemetics and fluids. He agreed that this can result in an unreliable picture of the underlying pathology.[430]

290 Once again, I remind myself of the *Bringinshaw* principle and accept that a higher level of satisfaction is required in order to make a finding about Dr Henderson's diagnosis.

291 I consider that Dr Henderson's mind had been primed for a diagnosis of 'migraine' and I find that he approached his process with that conclusion in mind, leading to inadequate exploration of the cause of Kate's symptoms.

292 On the evidence presented, I find that Dr Henderson's diagnosis was unsound. He had not undertaken the assessment necessary to support that conclusion and, having regard to the information available to him, it was not a diagnosis that ought to have been reached.

Discharge

293 Professor Kelly said that, if Kate truly had a migraine, the treatment provided would have been appropriate. However, Professor Kelly said that Kate's condition upon departure should have prompted a reconsideration about her diagnosis and whether imaging should be conducted.[431] Professor Kelly said that even the fact that Kate had gotten down the stairs and into the car, but the thought of going back up the stairs was too much, was an opportunity to pause and consider that the situation was not right.[432] Professor Kelly expressed the view that she would not have considered Kate fit for discharge from the ED.[433]

294 Professor Kelly's opinion was that Kate's discharge was not appropriate as her symptoms persisted at a disabling level which should have prompted reconsideration of the possible diagnosis.[434] Her view was that there was a lack of appreciation of the sudden change in Kate's headache and of the fact that it was not like her normal headaches, even though that is what she is recorded as saying. Professor Kelly said that while Kate had said that she also reported things that were different (ie. severity and duration) which were underappreciated.[435]

295 Associate Professor Lee's opinion was that it was not appropriate to discharge Kate without some form of brain imaging.[436] He said that the diagnosis of migraine comes

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[428] T749
[429] T196
[430] T197
[431] Exhibit C12 at 17 and Exhibit C12a at 7
[432] T318
[433] T319
[434] Exhibit C12 at 18
[435] T305
[436] Exhibit C19 at 4

from normal physical examination combined with normal brain imaging and that a diagnosis cannot be made without both components. He observed that if a patient had attended his clinic in Kate's condition and told him that she was experiencing her usual migraine, he would discount that and want to check for intracranial pathology.[437] He said he would send this patient to the ED.

296 Associate Professor Hand said that it was appropriate to consider Kate for discharge because her condition was assessed in the setting of presumed migraine which was worse than usual, she had responded to simple management and had been observed over about four hours.[438] He specifically based his conclusion about the appropriateness of the discharge decision on the assumptions he was asked to make; in particular he said '[t]here were no concerning features identified in the history or on neurological examination' and that Kate was 'relatively well'.[439] In his written report, he referred to Professor Kelly's opinion, which was based on all available facts rather than a narrow set of assumptions, as unreasonable.[440]

297 However, in his oral evidence, Associate Professor Hand was asked to incorporate in the concerns Mrs Sylvia raised before discharge. He agreed that '[i]f you believe that there is something not quite right, if you are not sure, if you don't feel – if you feel that there is something wrong, then ultimately you can order a scan'.[441] He gave the following evidence:

> Q. When you have a migraine at one end of the differential and you have an intracranial pathology on the other end of the differential, other than focal neurological signs, which can be subtle, how do you diagnose that.
>
> A. How do you differentiate the two?
>
> Q. That's right.
>
> A. I mean, the main one, we've mentioned this, the focal neurological signs. I think the duration, any other associated features, has the patient got a fever, for example, are they from a certain - do they have certain underlying features, are they pregnant or recently delivered a baby, do they have an underlying deficiency, do they have an underlying cancer? So there are other sort of factors that might increase the risk of there being an underlying structural process, and that might sway you towards one way or the other.
>
> Q. So if you're really just not sure and, you know, something's not quite right but you can't clinically put your finger on it, isn't the best way to satisfy yourself that there is no underlying pathology to order a scan.
>
> A. That's absolutely true. If you believe that there is something not quite right, if you are not sure, if you don't feel - if you feel that there is something wrong, then ultimately you can order a scan. There are risks associated with ordering a scan, there are risks of doing a scan on everyone. You know, the assessment was made in the Emergency Department - sorry, in the Sefton Park. There wasn't features that were concerning.
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> Q. That brings me to my final question, which was, when Mrs Sylvia arrived, she conveyed her concern to Dr Henderson about a number of things: (1) that Kate did not have a formal diagnosis of migraine; secondly, that she was concerned about her. Is

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[437] T844
[438] Exhibit C20 at 14 and T955
[439] Exhibit C20 at 15-16
[440] Exhibit C20 at 27
[441] T979

that not the tipping point at which, as a doctor listening to a family member who knows the patient better than anybody, that they do satisfy themselves one way or the other or at least reduce the risk of them letting a patient go who is very unwell.

A. You know, I take that onboard. I think that Mrs Sylvia said that there was no formal diagnosis of migraine. We talked a little bit about what are the clinical features to make that diagnosis, I think that Dr Henderson was satisfied with that diagnosis of migraine, I am satisfied with the diagnosis of migraine based on the symptoms provided, so I think I would address that back to Mrs Sylvia, that we're fairly confident with that diagnosis. I think that Kate had been in the department for some hours and had settled, had resolved with very minimal treatment. So it was behaving like a migraine, and there had definitely been improvement. I'd be reassured by that. If there were persistent signs, if there were issues that had progressed, that would be very concerning, that would be different. I know that Mrs Sylvia had raised issues. The objective findings from the ambulance staff, the emergency staff and Dr Henderson were that there wasn't the evidence of dysarthria, there wasn't evidence of altered consciousness and things like that. So the objective evidence before them was clear. Yes, it's very difficult, you know? I do take your point, and in a different scenario, say, my clinical rooms, even consulting rooms, yeah, often you will organise a scan to assist in helping reassure everyone that there's nothing sinister going wrong. Most scans that are ordered for headache are normal.[442]

298 Professor Szoeke said that a repeat blood pressure test should have been conducted prior to discharge to confirm normalisation.[443] Her opinion was that, in the context of another episode of usual migraine, the discharge was reasonable.[444] Professor Szoeke provided no analysis as to why she viewed Kate's presentation as 'another episode of usual migraine' and did not address the nuances in Kate's condition raised by Professor Kelly, which Professor Kelly said meant that this was not another usual migraine for Kate. I understood Professor Szoeke's approach to have simply taken Dr Henderson's diagnosis at face value and determined it to be appropriate. She reached her conclusion on the basis that 'there is no evidence that the treating team SAAS or Sefton were aware of these 'red flags', but without assessing whether they ought to have become aware, either through questioning or examinations.[445] She did not assess whether the presumption of a proper prior diagnosis in the absence of any record of that, was appropriate. She did however state that if any of the red flags had been detected, then a different treatment path would have been expected.[446]

299 In the end, Professor Szoeke concluded that 'it would be unacceptable to discharge a patient with persistent headache, nausea and vomiting. The slurred speech, inability to walk without assistance and inability to open her eyes to light are considered clear neurological deterioration and symptoms which require further assessment'.[447] However, she disagreed that those issues factually existed. As I have set out, I have found that they did.

300 Professor Szoeke commented on Mrs Sylvia's observation in the car park of the Sefton Park HASDS that Kate's left hand was 'clawed' and that she was not able to hold a vomit

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442 T978-T980
443 Exhibit C18 at 29
444 Exhibit C18 at 30 and 33 and Exhibit C18a at 16-17
445 Exhibit C18a at 9
446 Exhibit C18a at 14
447 Exhibit C18a at 9

bag properly. She said 'it could be a focal neurological symptom, it could be stress, it could be pain, it could be .. she felt maybe unsteady, … she was maybe gripping'.[448] She said she would absolutely assess it. She spoke about not forcing Kate to have a reassessment if she did not want it. She spoke about the fact that a bleed onto brain cells would place those cells into shock for days, making transient neurological symptoms impossible. She did not provide an explanation for how the objective reality that occurred clinically could therefore be; that Kate had symptoms that were either not constant or not observed by all.

301 Associate Professor Lee viewed Kate's presentation at this time differently. He agreed with Professor Szoeke's view that the clawing of the hand was likely due to blood on the brain cells,[449] but said that other explanations were possible as well.[450] He said that even if it was blood, it could have been a small bleed and that the clawing would have been dystonic posturing. He said that, given only one of Kate's hands was seen to be clawed, then he would give it a lot of weight because it raises a hemispheric type of brain issue.[451] He said he taught medical students that as soon as you observe a unilateral issue, you think there is something going on in the contralateral hemisphere of the brain. He explained that when that is combined into a patient who has nausea and vomiting, he would think about potential raised pressure. Given Kate had a headache originating on the right, and she had clawing on the left hand, Associate Professor Lee opined that there were two pieces of evidence demonstrating an issue localised in the right hemisphere, which he referred to as 'a big warning sign'.[452] He said 'red lights are just going all over, … my red alert signs are just going through the roof at this point in time'.

302 Associate Professor Hand said that a recurrence of vomiting had the capacity to arouse concern, but only when it was accompanied by a new neurological symptom or an abrupt worsening of the headache.[453] He was not asked whether the clawing of the hand observed by Mrs Sylvia when Kate was put into the car was a potential new neurological symptom that had the capacity to arouse concern in combination with the recommencement of the vomiting. He did concede that the vomiting recommencing would have ideally led to a reassessment and that the clawing might be neurological in origin or it might be something else.[454] Associate Professor Hand opined that the most common cause of a brief episode of clawing is a carpopedal spasm which can be brought about by hyperventilation, dehydration, low calcium levels or low vitamin levels. He agreed that Kate had recently been hydrated with intravenous fluid.[455] He said that this presentation as a neurological symptom is rare and his index of suspicion on the basis of the clawing would be low if he saw a patient with it. He postulated '[t]he issue is of course is it likely to be [a focal neurological symptom] and how likely is it to be and that's the bit that needs assessment and sorting out and that further assessment would have been reasonable, even though he considered carpopedal spasm was the most likely explanation'.[456] He said that '[i]f it

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[448] T777
[449] T856
[450] T862
[451] T840
[452] T841
[453] Exhibit C20 at 16
[454] T965
[455] T998
[456] T997

happened momentarily and was not visible to the medical officer assessing the patient, one would probably conclude that it was a carpopedal spasm and nothing sinister'.[457]

303 The submissions on behalf of Dr Henderson and others suggested that there were 'no focal neurological symptoms and therefore no intracranial bleed'. It was submitted that it then followed the imaging would not have revealed anything and so transfer to a tertiary facility was not warranted. I find this reasoning to be circular. It is not logical to say that because nothing was detected without a full assessment then Kate did not have the condition therefore no full assessment was required. The only correct aspect of that reasoning is that if you do not properly assess for a condition, then it is unlikely that you will find symptoms of that condition. In my view, if there are symptoms suggestive of a condition then best practice assessment for that condition must be conducted. Professor Kelly and other experts gave evidence establishing ample grounds for a full assessment that existed before Kate had left the HASDS car park.

304 Overwhelmingly, the evidence supported a finding that Kate should not have been discharged without a referral for imaging. As conceded by Associate Professor Hand, the tipping point was when Mrs Sylvia expressed concern for her daughter. Professor Kelly was of the view that the tipping point should have been well before that with factors such as the character of the headache and the fact that Kate had never sought emergency treatment for a headache before. However, even disregarding certain aspects of Mrs Sylvia's evidence (as Associate Professor Hand was asked to do) both Dr Henderson and Mrs Sylvia agreed that there was a conversation between them about her concern for Kate. I therefore find that Dr Henderson should not have discharged Kate home without imaging.

Conversation at discharge

305 There was a conflict in the evidence about Dr Henderson's interactions with Mrs Sylvia. While both agreed that Mrs Sylvia spoke to Dr Henderson about her concern for Kate, the details of the conversation were in dispute.

306 Mrs Sylvia was obviously traumatised by the events of 2 and 3 December 2021. As touched on earlier, she wrote an account of her recollection of events within two weeks of Kate's death.[458] Dr Henderson made no notes of his interactions with Kate (other than in the clinical records), despite having participated in an internal review and being made aware that her death would likely be investigated by the State Coroner.

307 The conflict between Mrs Sylvia's account and Dr Henderson's can essentially be reduced down to one meaningful point; whether Mrs Sylvia told him that Kate's speech was slurred (or was abnormal) or not. Mrs Sylvia's sworn evidence was that she did. Her written account recorded within weeks of Kate's death documented that she did. I consider that Mrs Sylvia was using language of that nature she did on the day, as she was recorded saying that in the emergency calls and in a text message. Therefore, I find on the balance of probabilities that Mrs Sylvia did tell Dr Henderson that Kate was either slurring her words or had abnormal speech, with the effect being the same for the purposes of what Dr Henderson should have done.

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457 T999
458 Exhibit C10 at 8

308 Dr Henderson denied that Mrs Sylvia had said that and went a step further by asserting that Kate was not groggy at all. His evidence that Kate was alert and unaffected during their interactions was not only inconsistent with Mrs Sylvia's account, but also with the contemporaneous nursing notes.[459]

309 Dr Henderson said he was certain that Kate was sitting up while he was talking to Mrs Sylvia. Mrs Sylvia gave evidence that Kate was not sitting up. Ms Collins gave evidence that she could see the conversation happening and that Kate was 'dozing' on the bed like she had been.[460] Mrs Sylvia gave evidence which was not contested that Kate had to be assisted to the car. It is inherently unlikely that Kate was well enough to sit up on the bed when a short time later she had to be assisted to the car and began vomiting in the process. Dr Henderson allowed for the possibility that his memory was incorrect, although he believed that it was not.[461]

310 In response to the differences between Dr Henderson's account and Mrs Sylvia's, Dr Henderson said 'I'm confident in my recollections'.[462] He then conceded that he was wrong about not being told that Kate was on a contraceptive pill but said that he had not remembered anything else incorrectly.

311 Ms Collins said that there were informal discussions about Kate's case at HASDS following her death. She recalled that the discussions centred around Kate's condition having improved with treatment.[463] Ms Collins said that her observation of the practice at HASDS at the time she was giving evidence was that a patient with a migraine who improved with treatment would not be given a CT scan.[464]

Collateral information

312 As I touched on at the beginning of this Finding, the importance of collateral information from a family member or care giver cannot be overstated.

313 Dr Henderson gave evidence about the limited weight he placed on Mrs Sylvia's observations. I find that he gave insufficient weight to what she was telling him. Professor Kelly said that the presence of serious concern by a close relative should have resulted in either transfer to hospital or further assessment. Professor Kelly explained that family members usually know the patient well and are more adept at detecting subtle changes which may not be evident to clinicians.[465] She gave evidence that patients are not always aware of all of their symptoms, which makes all sources of information valuable.[466] She said that concern from a relative has been formally added to some treatment guidelines, such as sepsis in adults and children. Indeed, some hospitals provide phone numbers beside patients' beds for family members to call if they have concerns that they think are not being taken seriously.[467] Associate Professor Hand described the lack of family member input during the COVID-19 pandemic as impacting

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459 Exhibit C6 at 9-11
460 T404
461 T172
462 T185
463 T420
464 T421
465 Exhibit C12a at 10 and T280
466 T273
467 T807

emergency physicians, but also neurology and stroke staff in their assessment of patients.[468]

314 Professor Kelly explained that where a doctor hears from a person that knows the patient well that they are not themselves, it should give cause for concern about whether something has been missed.[469] She described this as an additional safety measure.[470] Professor Kelly said that Dr Henderson's approach of allowing Kate's own account to override Mrs Sylvia's observations was a missed opportunity for a greater discussion, including about what had happened prior to arriving.[471]

315 Professor Kelly explained that when patients do not feel well, they do not necessarily explain their symptoms fully, they just give a basic answer so that the process moves along.[472] Doctors are aware of this tendency and it therefore makes collateral sources of information important. She said that it is true that only the person experiencing the illness can describe it, but that does not diminish the important pieces of information that other people can reveal.[473] It is the subtle changes that family members often point out. Professor Szoeke described family members as providing 'exceptional history'.[474] Professor Szoeke said she was 'pleased to see' that the information provided by Mrs Sylvia was 'not at all discounted' because Kate's speech was checked by clinicians. This position does not deal with the issue which Professor Kelly gave comprehensive evidence about; of the appropriateness of allowing one source of information to override the other.

316 Associate Professor Hand said 'I think that the information that a family member brings to a consultation is actually important and needs to be considered. What a family member brings, and in this case Mrs Sylvia brought, was her observations, her concerns and those needed to be assessed'.[475] However, when asked about how the information from Mrs Sylvia factored in, Associate Professor Hand spoke about the 'objective findings from the ambulance staff, the emergency staff and Dr Henderson…'.[476] This, in effect, allowed the clinicians' observations to override Mrs Sylvia's concerns and observations in the same way that Dr Henderson did. This was, no doubt once again, influenced by the fact that he was asked to assume that Dr Henderson conducted the most comprehensive examination possible, beyond that which a specialist would undertake.

317 In respect of the awkwardness of treating an adult patient with a family member intervening, Professor Kelly said that this happens often and is a process of exploring discrepancies rather than allowing one source of information to override the other.[477]

318 Professor Kelly explained that where there was conflicting information about whether Kate had previously had migraines or not, Dr Henderson should have probed the issue of prior diagnosis. Dr Henderson could have asked who made the diagnosis and whether

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[468] Exhibit C20 at 7
[469] T306 and T368
[470] T807
[471] T306 and T307
[472] T307
[473] T356
[474] T770
[475] T974 and T1030
[476] T979
[477] T359

Kate was taking migraine prevention medication. Associate Professor Hand said that he would have carefully considered the discrepancy and if he was not certain he would ask for corroborative information.[478]

319 It is particularly disappointing that the anchoring bias that was evident in Dr Henderson's approach to Kate's case was not dismantled when Mrs Sylvia specifically brought into question any prior diagnoses of migraine and that Kate was not herself.

320 I consider that Dr Henderson should not have taken at face value the idea that there had been a prior diagnosis. I find that Dr Henderson gave inadequate regard to Mrs Sylvia's impression of Kate being 'not right' and that he should have explored that in more detail with Mrs Sylvia and reassessed Kate with an open mind. A short time after Dr Henderson's discussion with Kate, Kate struggled with the task of reaching the car. Mrs Sylvia observed her hand clawing. It is very likely therefore that a full reassessment at this point, or moments before, would have detected a neurological deficit.

Assessment of the care at The Queen Elizabeth Hospital

Code Stroke

321 Once at TQEH, the issue of a Code Stroke activation became relevant. Dr Duffield was asked about a procedural document applicable across the Central Adelaide Local Health Network (of which TQEH forms part) titled 'Acute Stroke – Pathways and Management' which had been in existence in one form or another since 2016.[479] The document set out the following, inter alia, in respect of the procedure to be adopted at TQEH:

CODE STROKE CRITERIA
• ROSIER score≥1 (below) • Less than 4.5 hours since symptom onset ('found on floor' and 'wake up strokes' NOT excluded) • Living independently with no history of severe cognitive dysfunction or imminently terminal illness OR 4.5-24 hours since last seen well and clear cut unilateral limb weakness and/or dysphasia and/or hemineglect

ROSIER score
Loss of consciousness or syncope? Y(-1) N(0) Seizure activity? Y(-1) N(0) NEW ACUTE onset – 1.Asymmetric facial weakness Y(+1) N(0) 2.Visual field deficit Y(+1) N(0) 3.Asymmetric arm weakness Y(+1) N(0) 4.Asymmetric leg weakness Y(+1) N(0) 5.Speech disturbance Y(+1) N(0) **Score ≥1, assume diagnosis of stroke•**

[478] T1031
[479] Exhibit C14 at Appendix 3

346 Dr Raniga gave evidence that in the Code Stroke criteria, all three of the dot points need to be met, or otherwise the last criteria in the box.[480] The criteria set out in the protocol are therefore more clearly described as:

> EITHER:
>
> 1. a. ROSIER Score ≥ 1 AND
>   b. Less than 4.5 hours since symptom onset AND
>   c. Living independently with no history of severe cognitive dysfunction or imminently terminal illness.
>
> OR
>
> 2. 4.5-24 hours since last seen well and clear cut unilateral limb weakness and/or dysphasia and/or hemineglect

347 The document sets out that, where the Code Stroke criteria is met, a notification to the RAH Stroke Unit must be made, and sets out the process to follow. It then requires an immediate transfer to the RAH before any scan is conducted, or alternatively depending on clinical likelihood and patient status, a CT scan may be conducted prior to transfer if it is immediately available. It specifies that the 'Lead is QEH … senior ED doctor … for ED patients'. Dr Peerbaye explained that the result is that if he had called a Code Stroke, he would have remained the lead doctor in charge of Kate's care.[481]

348 Dr Duffield said that, even if Kate had suffered a stroke, she did not fit within the Code Stroke criteria at the time of her assessment of her because Kate's history was of two to three days of initial symptoms.[482] She said that her understanding was that it was the initial onset of symptoms that needed to be considered under the protocol, not a worsening of symptoms.[483] She explained that the purpose of a Code Stroke is to determine whether a patient is suitable for thrombolysis or thrombectomy, which is generally within four-and-a-half hours from initial symptoms.[484] She clarified that a Code Stroke would only be called by a consultant-level doctor and that not every patient who has suffered a stroke will fit within the Code Stroke criteria.[485]

349 Dr Peerbaye gave evidence that he was aware of the protocol, but not all of the specifics of it.[486] Dr Peerbaye explained that often when Code Strokes are called at TQEH because of acute symptoms, the stroke team ask them to investigate it further to come to a position where they are more convinced that it is a stroke before progressing. He gave an example of a patient he had treated during his shift shortly before giving evidence who had left-arm weakness and a Code Stroke was called, with the stroke team asking him to do further work and then they eventually declined to accept the patient.[487] Dr Peerbaye observed that this is a common occurrence. He explained that he considered the protocol to be more aimed at guiding ambulances to the right location in the first place rather than requiring the transfer of patients from one tertiary centre with imaging facilities to another. Dr Peerbaye said that in his experience, calling a Code Stroke does not have the

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480 T693
481 T634
482 T579
483 T581
484 T576
485 T580
486 T611
487 T611

effect of 'rallying the troops'.[488] He said he did not see an activation of greater resources to respond to the patient when they are in TQEH. Dr Peerbaye said that the Code Stroke process involved him contacting a junior doctor in the Stroke Unit and that it did not usually result in him receiving guidance about investigations that he had not already thought of.[489] The process came down to the question 'will you accept the care of this patient right away without me doing investigations or do you want me to do investigations here before sending the patient to you?'. His experience was that TQEH radiologists would suggest an MRI instead of a CT perfusion scan and the RAH stroke team would agree that it was acceptable.

350 Dr Peerbaye agreed that he could have called a Code Stroke in order to be cautious. He agreed that he could have called a Code Stroke and continued with the investigations, but said that no more investigations would have resulted than occurred. He said that he probably did not turn his mind to the specific question of whether to call a Code Stroke.[490] He agreed that the treating team were thinking of an infectious cause which probably led to them not thinking about other differential diagnoses such as stroke.[491]

351 Dr Peerbaye gave evidence that at the point Ms Green detected 'severe [left] sided weakness' (noted at 5:22 pm),[492] Kate fit within the Code Stroke criteria, as she would have had a ROSIER score of 1.[493] Dr Peerbaye agreed with a question that suggested that, given Kate had presented with equal limb strength at triage, there had been a change in Kate's symptoms within a four-and-a-half hour window.[494] However, Dr Peerbaye's concession was not properly based in the evidence as he was misguided by the assumption in the question. Given that the triage was written and lodged at 12:12 pm and the left-sided weakness was noted at 5:22 pm, there was actually a five hour and 10-minute window. Dr Peerbaye explained that Kate had had symptoms for two days which suggested that the pathology causing her symptoms had an origin of more than four-and-a-half hours old.[495] In any event, Dr Peerbaye's shift had finished at 4 pm and he was not present when this escalation was found.

352 Dr Raniga gave evidence that he did not consider calling a Code Stroke at any point because the MRI had initially suggested an abscess and then subsequently a bleed, neither of which would result in a Code Stroke.[496]

353 Associate Professor Hand initially said that a Code Stroke should have been called upon Kate's arrival at TQEH, as at that point, Kate had presented with persistent headache and vomiting which was unresponsive to treatment the day prior, was unable to walk, had poor coordination and abnormal movements on the left side. After reviewing the evidence of Ms Mills, he accepted that there was nothing observed at triage that should have initiated the Code Stroke process.[497]

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[488] T613
[489] T628
[490] T627
[491] T617
[492] Exhibit C7 at 35
[493] T610
[494] T610
[495] T612 and T616
[496] T649
[497] T941

354 Associate Professor Hand said that a Code Stroke should have been called at 1:59 pm.[498] His reasoning was that by 1:59 pm, a registered nurse had found weakness in Kate's left extremities and brought it to Dr Peerbaye's attention. He said that this demonstrated the development of a significant focal neurological deficit which should have prompted a Code Stroke.

355 Professor Kelly disagreed with Associate Professor Hand that a Code Stroke should have been called upon Kate's arrival at TQEH.[499] In particular, she pointed out that, at triage, Kate had no altered conscious state or speech difficulty or other neurological features, and her limbs had equal power.

356 Professor Kelly made the practical observation that if a Code Stroke had been called at about 2 pm when Kate's neurological symptoms were reported to Dr Peerbaye, it would be unlikely that the ambulance service would have been able to facilitate an immediate transfer to the RAH at that time given the well-known state of their resourcing at the time.[500]

357 Kate's family suggested that there was a 'significant failure' of training and procedures 'such that doctors were not familiar with probable lifesaving Code Stroke procedures'. While I accept that it was clear that the doctors did not have intimate knowledge of the Code Stroke procedure, I understand that to be within the context of stroke services not being provided at TQEH and expert assistance instead being available on the phone from the RAH within the same network. I was not satisfied that there was a failure of a concerning nature in the understanding of Code Stroke procedures. Following the evidence of Dr Raniga (set out above) I was also not satisfied that a Code Stroke should have been called while Kate was at TQEH.

Dr Duffield (under instruction from Dr Peerbaye)

358 Professor Kelly explained that, aside from simple cases where a diagnosis can be made, the role of ED clinicians is to risk stratify patients, which involves taking a history and examination and directing investigations or referrals.[501] Part of this process is to exclude serious risks.

359 Professor Kelly said that when Dr Peerbaye was notified at 1:59 pm that there were 'new neurological changes and weakness in [left] extremities',[502] there should have been an urgent assessment by an appropriately experienced clinician to determine investigation and treatment. Dr Duffield gave evidence that she was asked to do that minutes later.

360 Professor Kelly said that Kate should have been in a high acuity area from her arrival and then in a resuscitation room once her deterioration was identified.[503] She said that if there was no space available, one-on-one observation can be achieved in a normal treatment bay.

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498 T941
499 Exhibit C12a at 8
500 Exhibit C12a at 9 and T804
501 Exhibit C12a at 5 and T797
502 Exhibit C7 at 35
503 T295

361 Professor Szoeke said that Kate's blood tests indicated an infection.[504] Professor Kelly said that the results were consistent with, but not diagnostic of, an infection such as viral encephalitis.[505] She said that it was perfectly reasonable for Dr Duffield to consider encephalitis which was a valid differential diagnosis. I accept this evidence, and I consider that each of the differential diagnoses Dr Duffield discussed with Dr Peerbaye were reasonable diagnoses to explore.

362 Professor Kelly made an allowance for the fact that TQEH does not have a specialist neurosurgical service. In that context, her opinion was that the assessment, investigation and treatment were appropriate and the history and examination were detailed and appropriate.[506] In particular, she highlighted that Dr Duffield immediately suspected a serious diagnosis and made a referral for imaging within a reasonable timeframe.[507] Professor Szoeke agreed that following Dr Duffield's review, the neuroimaging was arranged in a timely fashion.[508]

363 Professor Kelly said that Mrs Sylvia's observation that Kate's arm was curling up was an indicator of potential neurological dysfunction.[509]

364 Associate Professor Lee said that transfer to the RAH should have occurred as soon as the haemorrhage was detected, but alternatively said that a CT angiogram and CT venogram could have been conducted while waiting transfer which would have found the CVST thereby allowing for anticoagulation to be commenced at TQEH.[510] He said that admitting a patient to a specialist stroke centre results in improved survival rates. His opinion was that the actual care provided was appropriate; that is, she was reviewed and an urgent brain image arranged.[511] He was critical of the timeframe involved in the process, in particular what he saw as a delay to the request for imaging, a delay to the interpretation and a delay to the transfer to the RAH.

365 Associate Professor Lee said that while headache, altered mental state, slurred speech and muscle weakness can be signs of brain herniation, they are not sufficiently specific to differentiate a diagnosis of brain herniation.[512] Professor Lee also said that there were no signs of midline shift on the MRI taken at TQEH which meant that a brain herniation was not possible at that time.[513] He said that if he was in the clinicians' shoes at TQEH and he had thought there was a brain herniation, he would deploy a bundle of care to address that.

366 Associate Professor Hand said that Kate presenting to TQEH instead of the Sefton Park HASDS 'did not result in better clinical assessment, appropriate imaging, early institution of therapy, or an early and urgent transfer to a tertiary hospital'.[514] This is difficult to reconcile with the evidence because Kate had a genuine neurological assessment by Dr Duffield and imaging was ordered and conducted in a timely way which detected a

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[504] T756
[505] T799
[506] Exhibit C12a at 11
[507] Exhibit C12 at 18 and T308
[508] Exhibit C18 at 33
[509] T293
[510] Exhibit C19 at 5
[511] Exhibit C19 at 5
[512] T918
[513] T920
[514] Exhibit C20 at 37

condition that saw an arrangement made to transfer Kate to the RAH. This was vastly superior to Kate's treatment at Sefton Park where she received a screening neurological assessment, fluids and pain relief.

367 I find that Dr Duffield's assessments and treatment were reasonable and appropriate.

368 Kate's family submitted that a reminder to ED consultants was called for, as to the fact that they have responsibility for patients under the care of doctors under their supervision. I take into consideration the manner in which EDs operate and that more junior doctors take instruction from more senior doctors. I found nothing in the evidence that gave me any cause for concern about this approach, nor of any of the doctors' understandings about their responsibilities. I find that Kate was provided the level of care and attention that was expected.

Dr Raniga

369 Professor Kelly explained that in an ED, it is reasonable for clinicians to rely on the interpretation of advanced imaging by radiologists. Professor Szoeke agreed. Associate Professor Lee said that if he was not a neurologist and a radiologist had not told him there was a venous thrombosis then he would not have commenced treatment for that condition.[515]

370 Dr Raniga reflected on what he called a missed opportunity to escalate the request for an ambulance when Kate's Glasgow Coma Scale score dropped to 13 at 8:48 pm. Professor Kelly explained that in a busy ED, once an ambulance is booked the doctor in charge has many competing priorities which means that time passes very quickly and that it is easy for there to be a long delay without it being noticed by the doctor, unless it is specifically brought to their attention.[516]

371 Associate Professor Lee gave evidence that, whatever the vascular problem identified is, a general principle of stroke medicine is that time is of the essence. He said that a colloquialism used is that 'time is brain'.[517] Given that intracranial haemorrhage had been identified, Associate Professor Lee was critical of the time taken for Kate to commence treatment.

372 Associate Professor Lee agreed that by the time Kate had returned from the MRI, the thrombosis had propagated and caused an intracranial haemorrhage.[518]

373 Associate Professor Lee said that in light of the information provided to Dr Raniga by Dr Barker and then Dr Tew, it was reasonable to request transfer to the RAH on their advice.[519]

374 I find that Dr Raniga's approach to Kate's case was entirely appropriate. I will address separately below the submissions made about Dr Raniga's approach to the ambulance delay.

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[515] T923
[516] T803
[517] Exhibit C19 at 6
[518] T913
[519] T925

The choice of imaging modality

375 Professor Kelly noted that it was unclear as to why MRI had been chosen at TQEH.[520] However, she said that the choice of modality is often made in dialogue with radiologists and allowed for that possibility. She did not reach a conclusion that the choice was inappropriate.

376 Professor Szoeke said that some clinicians prefer CT venography and others prefer MR venography, but that there is no 'gold standard'.[521]

377 Associate Professor Lee said that in almost every jurisdiction CT scans are far easier to access, so he considered it extraordinary that an MRI had been ordered.[522] He explained that a CT scan would take five minutes to complete, whereas the preparation work for an MRI would take ten minutes alone. He said that if a CT scan had been performed quickly, Kate's condition would have been identified earlier which would have allowed for anticoagulation treatment to commence earlier.[523]

378 Dr Peerbaye rejected criticisms of his choice to order an MRI for Kate. He gave reason for his decision. It was a considered one. He explained that where the criticisms relate to an MRI taking longer than a CT scan, that was not the experience at TQEH.[524]

379 Associate Professor Hand's opinion was that, if a Code Stroke had been called when Kate showed left-sided weakness, this would have brought about a CT brain scan and a CT angiogram scan and immediate transfer to the RAH. He said that an MRI is not the 'investigation of choice' because of the longer timeframes involved and that most radiologists are more comfortable looking at CT scans.[525] He said that a basic CT scan would have identified haemorrhage which would have led to a CT venogram which would have then revealed the CVST.[526] Associate Professor Lee and Associate Professor Hand did not address the fact that the MRI conducted demonstrated the CVST, nor the evidence of Dr Peerbaye that, in the particular environment of TQEH, an MRI is not slower to access than a CT scan.

380 Dr Raniga said that if he had been treating Kate from the outset and suspected meningitis/encephalitis, he would have asked for a CT brain scan without contrast in order to get a very quick answer about intracranial pressure, which would then have allowed him to take a lumbar puncture quicker.[527] He said he then would have proceeded with the lumbar puncture. He said that there are less slots for emergency patients to get an MRI and that generally CT scans are quicker, particularly without contrast. Dr Raniga said that if a CT scan without contrast was ordered, it would not have detected the condition that Kate was ultimately found to have had as it does not show the vasculature of the brain or clots.[528] That would require a CT angiogram/CT venogram. He said that if the basic CT had been done, it would have returned a normal result and if there were no signs of raised intracranial pressure, he would looked at Kate from head to toe and then proceeded

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[520] Exhibit C12a at 7
[521] T758
[522] T847
[523] T847
[524] T626
[525] T1027
[526] Exhibit C20 at 23
[527] T676
[528] T678 and T680

with the lumbar puncture test which would have returned a result of no infection a few hours later.[529] In the circumstances that existed, a CT scan rather than an MRI was unlikely to have made any actual improvement to Kate's journey at this point.

381 Professor Kelly said that while CT venogram is usually only ordered after compelling clinical features suggest it is required, she could recall instances where it might be ordered without a prior regular CT scan because the clinical picture itself is overwhelmingly suggestive.[530]

382 The evidence has not established any valid criticism of the choice to conduct an MRI at TQEH, particularly where it produced imaging which depicted the condition eventually diagnosed.

Radiology

383 Associate Professor Hand said that the MRI scan was poorly reported.[531] He said that there was a false sense of security instilled by Dr Tew's advice that the haematoma was seven days or more in age and that a follow-up scan in six weeks would be sufficient. He was critical of the radiologists for not recommending an urgent CT scan to assist in identifying the age of the haemorrhage and to look for its cause.

384 As I have set out, Dr Tew conceded that his report was incorrect and I find that to be so. I also agree that the recommendation of a follow-up scan in six weeks was falsely reassuring but did not impact on Dr Raniga's concern for Kate.

Delays

385 Professor Kelly said that a lights and sirens transfer is very rarely requested, only where there are 'really, really, really serious life-threatening situations' and a person needs to be at another facility immediately.[532] Professor Kelly said that the delays involved in moving Kate represent a dysfunctional system.[533] She explained that access block, a multi-factorial international problem, was likely at play. In addition to that, the health system was dealing with COVID-19, which brought about clinicians' sick leave and a high volume of urgent cases. Professor Kelly points out that these issues are not within the control of individual clinicians. The recent coronial findings of *Panella, Skeffington and Jessett* [2025] SACC 21 explored these issues at great depth and made recommendations to address issues associated with access block.

386 Professor Szoeke made the practical observation that, after each call with the ambulance, the clinicians at TQEH would have been left with the impression that an ambulance would arrive soon.[534] It appeared that a CT scan was not conducted at TQEH after the MRI, likely in the expectation that Kate would have been transferred quickly to the RAH. Kate's CT scan at the RAH occurred at 12:59 am the following morning. It is important to remember that TQEH does not have neurology services. Therefore, an earlier CT scan

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529 T679
530 T802
531 Exhibit C20 at 23
532 T321
533 Exhibit C12 at 19
534 Exhibit C18 at 33

(prior to transfer) would only have had the effect of saving no more than 47 minutes upon arrival at the RAH, and allowing the medical staff advance notice of her condition.

387 Associate Professor Hand was critical of the timeframe taken to transfer Kate to the RAH and said that it resulted in a delay to the administration of heparin.[535] He said that patients with CVST '[t]he sooner we can start, the better' which he described as accepted but not proven practice.

388 Associate Professor Lee was critical of the delays in the ambulance transfer, describing it as 'an extraordinary delay'.[536] He considered that there was likely a role for the COVID-19 pandemic to play in the ambulance delay. Kate's family made a submission that it was unacceptable to wait three-and-a-half hours before escalating the ambulance request. Dr Raniga revealed his thought processes during his evidence. I was impressed by his candour. It is easy to criticise the decisions made by medical experts when approaching with the benefit of hindsight. I take into account that the ED is a busy place with many competing tasks. I accept Dr Raniga's explanation and in particular I accept that the information given about Kate imparted great urgency and that there was little to be done in order to increase that urgency. The strains on the ambulance system at the time are notorious. I find that there is no criticism to be made for Dr Raniga's approach of having the ambulance checked in on and being comforted by the advice given. While it is an unfortunate aspect of Kate's case that she was not able to be transferred quicker, I consider that this was reflective of the pressures on the health system at the time rather than reflective of any deficiency on Dr Raniga's part. More specifically, I do not accept the submission on behalf of Kate's family that greater emphasis on monitoring the arrival of the ambulance may have increased Kate's chances of survival to more than 50%. I do not accept that submission because I do not consider that the evidence established that greater *monitoring* of the ambulance delay would have had that effect. There was in fact no evidence at all that greater monitoring would have led to an earlier ambulance.

389 In any event, Professor Szoeke's evidence was that it was sound clinical thinking to have further scans conducted by the treating team, particularly in the setting of the MRI result at TQEH suggesting a chronic condition.[537] Professor Szoeke also said that the fact that Kate's CT scan returned a result with motion artefact might have impacted the clinical decision to have scans done at the RAH.[538]

390 In his evidence, Dr Peerbaye queried whether the technician completing the MRI might have raised concern about what they were seeing with a radiologist earlier.[539] He was not present when the scan was conducted. He was not able to comment on whether it would have made a practical difference. Of course, the Inquest heard the evidence from Dr Raniga that he had had a discussion at the time of the scan and was aware that an issue had been identified.

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[535] Exhibit C20 at 23
[536] T848
[537] Exhibit C18 at 30 and 33
[538] Exhibit C18 at 31
[539] T626

Assessment of the care at the Royal Adelaide Hospital

391 Professor Szoeke considered that the treatment provided at the RAH was appropriate.[540] She said that the treatment provided was in line with that recommended by scientific studies.

392 No other expert evidence was led about the treatment provided at the RAH. I have observed that every attempt was made to save Kate's life.

Reviews

393 An internal review was conducted on 8 February 2022, led by Dr Nicholas Farinola.[541] The panel did not interview Mrs Sylvia and appears to have relied purely on Dr Henderson's notes. The factual summary recorded by the review panel included that Kate had a three-day migraine which was similar to her previous migraines but more severe. It records 'no neurological symptoms reported and ambulating independently'. The panel recorded that they discussed a CT scan being referred by the Sefton Park HASDS, but concluded that current recommendations suggest 'if medical history and exam are normal, usually imaging tests will not show a serious problem'.

394 The panel concluded:

> The only possible missed opportunity was the fact that the patient had recently started a new contraceptive, which is a risk factor for CVST. A thorough best possible medication history may have identified the recent initiation of therapy and may have been a trigger to initiate an earlier CT of the head. But even then the risk of this is rare (incidence 3 in 1 million annually), and migraines are so common, the presentation at the time of assessment at HASDS was in keeping with migraine, and the actions taken were appropriate in this context. It is not known if there was an attempt to look up a list of prescribed medications in My Health Record, but in this case there was restricted access to the MyHR and there would not have been sufficient grounds at the time of HASDS evaluation to access the record for 'emergency use'.

395 The reviewers noted that the Sefton Park HASDS commissioned a CT scanner on site on 30 May 2022 which enables easier access to CT head imaging. The reviewers set themselves a task of auditing Dr Henderson's documentation about medication history.

396 Following the review, Dr Henderson was advised that his assessment and conduct was appropriate for the information that he had, but that he should have taken the step of obtaining an independent medication history.[542]

397 Given that Mrs Sylvia's account does not appear to have been considered, I understand how the conclusions were reached in this review.

398 In June 2022, Mrs Sylvia wrote to the Minister for Health raising concerns about Kate's death.[543] The Minister met with Mr and Mrs Sylvia in September 2022 and agreed to conduct a review. The Minister then directed (through the Chief Executive of his

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[540] Exhibit C18 at 30
[541] Exhibit C21 at DJT1
[542] T138
[543] Exhibit C21 at [6]

Department) the Australian Commission on Safety and Quality in Health Care to conduct a review.

399 The Commission appointed three senior clinicians to conduct the review; two from New South Wales and one from Victoria, two neurologists and one emergency physician. They conducted a review on the papers without the need for any interviews. They published their report in August 2023. The review team found that:

> … despite her symptoms, Ms Sylvia was transported to a facility that was unable to diagnose and treat the condition from which she was suffering. Her presenting symptoms of severe, prolonged headache, together with other neurological indications, might have led to identification of stroke had clinical pathways which triggered investigation for stroke been in use by the ambulance service.
>
> The transfer of Ms Sylvia to the intermediate care centre rather than a facility equipped to diagnose her presenting symptoms was a missed opportunity to commence appropriate treatment.
>
> The intermediate care centre was not equipped to undertake the diagnostic investigations necessary to identify the underlying cause of Ms Sylvia's symptoms. The centre remained anchored to a diagnosis of migraine which had, for some time, troubled Ms Sylvia and was recorded as her presenting problem. …
>
> Diagnostic investigations undertaken at The Queen Elizabeth Hospital identified a right temporal intracerebral haemorrhage but did not identify its cause which resulted in a missed opportunity to commence treatment at that hospital.
>
> The failure to provide an ambulance transfer from Queen Elizabeth Hospital to the Royal Adelaide Hospital within a reasonable timeframe, given the diagnosis, led to further delayed commencement of treatment of Ms Sylvia. Despite the health system being in gridlock at this time, there was no escalation to health service or South Australia Ambulance Service senior executives to ensure a time critical transfer.
>
> These missed opportunities may have adversely affected Ms Sylvia's outcome.[544]

400 The review team made three recommendations.[545] Firstly, for SA Health to review the protocols about appropriate facilities to receive prolonged headache and migraine in the presence of other neurological signs and symptoms, with a view to the protocols guiding these patients to facilities that are able to diagnose and treat stroke. Secondly, for SA Health to review protocols at intermediate care facilities so that patients arriving with that presentation be referred to facilities that are able to diagnose and treat stroke. Thirdly, for SA Health to develop a mechanism to identify patients who need immediate ambulance transfer and implement escalation strategies in cases of delay.

401 The Minister for Health subsequently endorsed the report. SA Health tasked Associate Professor Timothy Kleinig, the head of the Stroke Unit at the RAH to review systems and tools used by paramedics to manage patients who do not fit within Code Stroke criteria.[546] Paramedics currently use the ROSIER and ACT-FAST assessment tools. SAAS is undertaking an audit of stroke cases in the past three years to determine whether destination choice reflects the policies. SAAS has also released training to its paramedics in the form of a podcast episode which specifically discussed care pathways and also

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544 Exhibit C21 at DJT2 at 4
545 Exhibit C21 at DJT2 at 5
546 Exhibit C21 at [14]

some lesser-known pathophysiology of strokes. The episode included an interview with Associate Professor Kleinig. SAAS has also included clinical content for all types of strokes and severe headache pathophysiology and differentiation and the clinical practice points into its 2025 Professional Development Workshop compulsory program.[547] SAAS is also working on integrating patient data with the SA Telestroke Service which offers neurological support to paramedics who encounter stroke patients.

402 In addition to these projects, SAAS is working on a project which will see the introduction of an ambulance vehicle that contains a CT scanner on board that will provide imaging to the SA Telestroke Service and enable early assessment, diagnoses and differentiation of stroke type.[548]

403 Associate Professor Kleinig also reviewed HASDS' exclusion criteria and added 'any alteration in central nervous system functioning (eg. new onset potential stroke symptoms or signs, abnormal alteration in GCS, first time seizure or non-typical seizure, headaches with red flags, etc)'.[549]

404 New leadership has also been introduced at the Sefton Park HASDS with a tasking to introduce triage questionnaires in order to ensure that red flags are identified.[550]

405 SA Health introduced an interfacility transfer policy which now governs the process of moving patients between facilities in a more effective manner.[551]

406 I commend the review and the recommendations made, as well as the implementation of the recommendations.

Preventability

407 There was a fundamental tension in the evidence between academic and practical expertise. Academically, it was acknowledged that it is impossible to study the precise area of delay to treatment because of the ethical limitation of withholding treatment for a known condition. Therefore, extrapolating back to an earlier time, where by virtue of Kate's symptoms and what is known about the propagation of a CVST, was the only way to assess the issue of preventability. Professor Szoeke in particular was reluctant to engage in this exercise.

408 There were essentially three fundamental differences in the approaches of the clinicians and between the various experts who gave evidence.

409 The first was the existence of and importance of transient neurological symptoms. Given that this issue arose in respect of the ambulance service and Dr Henderson, rather than in a setting of a neurological diagnosis, what should have happened, and what should happen in future, is for transient neurological symptoms to be treated with the same weight as persistent symptoms as was suggested by Professor Kelly and Associate Professor Lee.

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[547] Exhibit C21 at [18]-[21]
[548] Exhibit C21 at [22]
[549] Exhibit C21 at [23]
[550] Exhibit C21 at [25.4]
[551] Exhibit C21 at [26]

410 The other fundamental difference, somewhat related, is the observation of symptoms by clinicians as distinct from observations reported by family members. Again, given that these did not come up in the final diagnosis setting but were rather issues that faced first response and intermediate care workers, what ought to have happened and what should happen in future is that these reports are recorded and acted on, even in the absence of personal observation. The filtering of information or disregard of family reports creates a level of risk and should not occur.

411 The combination of these two issues had the potential to escalate Kate's care earlier, detect the true severity of her condition and commence treatment earlier.

412 Another fundamental difference was the diverging opinions about the likelihood of earlier treatment being of meaningful assistance. Of course, all experts agreed that Kate's condition had progressed over time to a point where multiple sinuses were clotted and there was haemorrhaging and swelling. Given that the progression was rapid, earlier treatment appeared to be more important. While it can readily be acknowledged that there is no specific scientific evidence that earlier treatment is statistically proven to prevent death, there are reasons as to why those studies might not exist. As a matter of fundamental logic, if a condition that is treated with anticoagulation and thrombolysis is treated before it progresses further and further, then it must be easier for those treatments to work. Associate Professor Hand said that there are not many scientific studies about early treatment because 'most patients do pretty well'.[552]

413 Associate Professor Hand's opinion was that Kate developed the CVST on 1 December 2021 or a day before that.[553] He said that this triggered a 'normal migraine for her'. He said that the intracerebral haemorrhage developed 36 hours after she presented to Sefton Park. His reasoning for this timeline was that this was the first time a clinician had specifically recorded a neurological abnormality. As discussed, he did not give any weight at all to any such symptoms observed by Mrs Sylvia earlier, as he was specifically asked not to for the purposes of his assessment. Associate Professor Hand also said that if a basic CT scan had been conducted on 2 December 2021, it would probably have been reported as normal, even though the CVST was present.[554] It is unclear on what basis he concluded that the scan would have been reported normal, other than his statements that it might have had a subtle presentation and many are missed and that CT scans are performed in slices which could miss an occluded sinus.[555] He agreed that a CT scan would detect abnormality at the point that haemorrhage began.[556] He said that there were no clinical signs of a haemorrhage on 2 December 2021 based on the assumptions he was asked to make.

414 Associate Professor Hand opined that if Kate had been administered anticoagulant on 2 December 2021, while he would expect a good outcome for most patients, he did not consider that Kate would have survived because her condition was so severe.[557] He said that it was rare for a patient to present with CVST and die within five days. He explained '[t]he rapidity of the progress of her clot and her haemorrhage and her disease makes me

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[552] T1020
[553] Exhibit C20 at 29 and 36
[554] T961 and T983
[555] T985
[556] T962 and T981
[557] T968 and T969

think that it is unlikely she would have responded to treatment at any point'.[558] He noted that Kate's condition did not appear to respond to anticoagulation therapy or the other treatments when treatment was eventually commenced.[559]

415 He observed that patients who die from CVST are likely to be older, present in coma or with reduced level of consciousness, have involvement in the deep venous system and their CVST be complicated by intracerebral haemorrhage.[560] Associate Professor Hand stated that many of these factors were present in Kate's case. Of course, none of those were present on 2 December 2021. Associate Professor Hand expressed the view that, on the balance of probabilities, anticoagulation therapy commenced upon arrival to TQEH would not have prevented her death.[561] In fact, his opinion was that no treatment would have prevented her death.

416 Associate Professor Hand said that he considered that Kate had some kind of intrinsic problem with her coagulation which accelerated her condition.[562] He described this as an assumption he made based on the fact that Kate had died despite treatment. I observe that there was no evidence in Kate's medical history or at post-mortem examination to suggest such an underlying condition. Accordingly, it is equally plausible that Kate's condition was treated too late to be effective and that she had no underlying clotting issue.

417 Associate Professor Lee agreed that it was possible that there was something rare and unusual about Kate that meant she was susceptible to a particularly severe form of CVST, however he highlighted that the post-mortem examination found nothing of the nature that would bring about a prothrombotic state. He explained that it was more likely that Kate's condition became severe because she did not receive anticoagulation therapy.[563]

418 Professor Szoeke said that if a CT venography scan or an MRI venography scan was conducted on 2 December 2021, the CVST would have been seen.[564] Associate Professor Lee agreed. He said that Kate would then have been transferred to the RAH urgently and commenced on anticoagulation and a 'whole lot of other things'.[565]

419 Professor Kelly said that the most common stroke protocol sets out that the critical period for ischaemic strokes is four-and-a-half hours, but that over recent years that has expanded out slowly as clot retrieval became an intervention.[566] In selected cases, it is now up to 24 hours.

420 Professor Szoeke said that in all cases of CVST, the treatment would include intravenous heparin.[567] She explained that this drug stops further clotting and can act to dissolve the clot that has already formed. Following that, an oral anticoagulation medication would be used for some time.

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[558] T969
[559] T1003
[560] Exhibit C20 at 32
[561] Exhibit C20 at 33
[562] T1014
[563] T888
[564] T759
[565] T857
[566] T803-T804
[567] T744

421 Dr Peerbaye gave evidence that if Kate had presented to him at TQEH the day she presented to the Sefton Park HASDS, he would have ordered imaging of her; either an MRI or a CT scan.[568] Associate Professor Lee gave evidence that a CT brain scan would have revealed the thrombosis and potentially the beginnings of the intracranial haemorrhage that was found the following day.[569] He explained that a venous bleed is within a low pressure system (as opposed to the high pressure bleeds of the arterial system) and so would have been present to a lesser degree than the following day.[570] This was therefore a genuine missed opportunity to identify and provide treatment for Kate's condition. Associate Professor Lee said that, upon finding the CVST, she would have been taken to a neurological high-dependency unit with anticoagulation therapy commenced in the form of heparin.[571]

422 Associate Professor Lee said that, if Kate had been taken to a tertiary hospital on 2 December 2021, been subjected to CT scans which detected the CVST, she would have successfully navigated the episode.[572] He reasoned that the anticoagulation treatment that would have followed is effective, even where there is bleeding, and that mortality is rare from this condition. He referenced academic material which is used to train clinicians.[573] He said that more intensive interventions, like a hemicraniectomy also carry high chances of regaining functionality, where they can be performed. He postulated that Kate had survived longer than 24 hours on her own without targeted intervention, which suggested intervention at this time would have been early, dealing with a clot that was less extensive.[574] If the clot was actually as extensive at this point as was later found then she would have died on this day. He said that if the clot had been as extensive on 2 December 2021 as it was on 3 December 2021, then you would expect the clinical presentation that Kate had on 3 December 2021 to be seen on 2 December 2021.[575] He said that the difference between the MRI at TQEH and the CT scan at the RAH demonstrated that the condition was progressing, although the haemorrhage was steady across both.[576] Associate Professor Hand agreed that Kate's condition was progressing over time.[577] Associate Professor Lee said that Kate's condition was not obtunded on 2 December 2021 and so she was not within a category where her death was unpreventable.[578]

423 Associate Professor Lee said that, even if Kate had not had anticoagulation treatment started until 3 December 2021, she would have survived.[579] He said that by that time, the clot would have propagated a further 24 hours which anticoagulation would have to try and deal with.[580] However, he noted that there was no midline shift at this point and said that he firmly believed that Kate would have had significantly improved survival chances,[581] which he estimated at greater than 50%.[582] He said that anticoagulation acts almost immediately and would have recanalized the clot and prevented the midline shift

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[568] T642
[569] Exhibit C19 at 3 and T844
[570] T908
[571] Exhibit C19 at 4-5
[572] Exhibit C19 at 5 and T868
[573] Exhibit C19 at 6
[574] T857
[575] T910
[576] T910
[577] T986
[578] T911
[579] Exhibit C19 at 5 and T866
[580] T868
[581] Exhibit C19 at 6 and T869
[582] T923

from occurring in the first place.[583] Associate Professor Hand said that whether there is a midline shift or not does not determine survivability of the condition. Having reviewed the MRI images produced at about 4:22 pm, Associate Professor Lee said that the CVST was clearly visible and should have been diagnosed upon review of those MRI images.[584]

424 Associate Professor Lee pointed to scientific evidence that even where there is a midline shift, a decompressive craniectomy within 48 hours of admission can achieve an increase in chance of survival of 74% (albeit with a wide confidence interval as low as 31%).[585] He said that following a hemicraniectomy, 60% of patients recover with no deficit after lengthy rehabilitation.[586] He explained that this procedure is done at the RAH and that it is not experimental or 'cutting edge'. He said it is standard surgery of last resort for ischaemic and venous stroke.[587]

425 Associate Professor Hand said that if a basic CT scan was conducted when Kate arrived at TQEH, it would have shown an acute bleed and possibly signs of CVST. He said that the stroke team would have been contacted and that they would have recommended CT venography which would have confirmed the CVST and led to the immediate commencement of heparin infusion.[588]

426 Professor Szoeke cited a scientific study which suggested that there is little difference in the outcomes for patients presenting early or late after symptom onset with CVST.[589] She said that the results showed that 93% of patients had a complete recovery, with a mortality/serious impairment rate of 4%. She said that a reduction in mortality had been recorded since the introduction of neuroimaging in the 1960s.

427 Professor Szoeke said that she was unable to find any scientific studies to support or refute an assertion that treatment hours earlier or days earlier would have improved Kate's prognosis, but agreed with the general proposition that in medicine earlier treatment has better outcomes.[590] She said that it cannot be assumed that Kate's death would have been prevented, even if she had treatment at any earlier point.[591] Professor Szoeke based this on scientific articles that she said showed no significant difference in outcomes between early and late presentations. She did not reconcile her opinion with the following passage from her report:

> However I also appreciate that the literature includes comments that if an **early** correct identification of cerebral venous thrombosis is achieved, the patient should receive appropriate treatment, such as anticoagulation therapy, the reduction of intracranial pressure or neurological surgery and the majority of these patients have a generally good prognosis…[592]
>
> (*emphasis added*)

428 Professor Szoeke also based her opinion on the fact that Dr Barker and Dr Tew had reported in their initial MRI results a haematoma of more than seven days old, which

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583 T911 and T922
584 T868
585 T869 and Exhibit C19c at e84
586 T870
587 T871
588 Exhibit C20 at 31
589 Exhibit C18 at 31
590 Exhibit C18a at 11
591 Exhibit C18 at 34 and Exhibit C18a at 14
592 Exhibit C18 at 32

Dr Tew had said during evidence was not correct[593] and could not bear upon the issue of preventability if treatment had been provided.

429 Professor Szoeke said that there are nine factors which predict poor outcome many of which Kate had. They are:

1. Age (being over 30 years old)
2. Having an infection
3. Focal neurology (predominantly seizures and hemiparesis) with early deterioration
4. Very low Glasgow Coma Scale score (ie: coma)
5. Location of the thrombus (in a deep sinus has a worse outcome)
6. Intracerebral haemorrhage
7. Midline shift on imaging
8. Need for craniectomy
9. Poor venous collateralisation or small vessel disease (ie: fewer backup routes for draining blood from the brain) [594]

430 Earlier in her evidence, Professor Szoeke had provided a list of some of these factors which included:

- Propagation of the clot
- Altered mental state [595]

431 Associate Professor Lee pointed out that Professor Szoeke had based her evidence about the nine factors on a single scientific article published in 2008.[596] He said that these factors would be prognostic because they represent a late or advanced pathophysiology of CVST.[597] He pointed out that Kate also had factors in her favour. Specifically, that she was young and that the clot was in a formation that was conducive to intervention.[598] Associate Professor Lee observed that the doctors at the RAH had assessed the situation and even at that point did not see treatment as futile. They considered techniques which went to the limit of medicine.

432 Associate Professor Lee said that none of the factors listed by Professor Szoeke would affect the decision to intervene and to intervene early.[599] All of the features of risk that Professor Szoeke said existed were not necessarily present earlier on. He also highlighted that Kate did not have a midline shift at the first scan, but did have it in scans at the RAH. This is further evidence that the clinical picture was worsening quickly over time.

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[593] T714
[594] T745 and T762
[595] T745
[596] T852
[597] T860
[598] T852
[599] T856

433 Associate Professor Lee disagreed that because Kate's thrombosis was in the deep sinus, she had a worse prognosis.[600] He explained that modern medicine will implement multimodal treatment, not just a single mode of treatment. He said that mortality rates for CVST had become less and less since the 1980s and that this was because of the use of multiple approaches to treatment taken simultaneously.

434 Associate Professor Lee said that, upon viewing Kate's scans, he did not detect any small vessel disease that would have prevented blood flowing through backup routes.[601]

435 Associate Professor Hand agreed with Professor Szoeke that there is no data to show that commencing anticoagulation earlier reduces mortality, but gave evidence that he always commences anticoagulation therapy immediately upon diagnosis.[602] He said that it is scientifically plausible that earlier treatment could improve outcomes, but that it simply had not been scientifically proven.[603]

436 Professor Szoeke explained that in the scientific studies she was basing her expert opinion on, the difference was not measured between those that received treatment and those that did not. Instead, the studies focused on the difference between those that got treatment early and those that got treatment late.[604] She did not say that the researchers had factored in the severity of the condition or how far it had progressed (as distinct from how long since symptoms had onset). This is an incredibly important distinction.

437 Associate Professor Lee disagreed with any suggestion that Kate had no chance of survival with earlier treatment. He said that it is important to view academic evidence in the context of what is known about the pathophysiology of the disease in question. He said that when determining whether to intervene, he will integrate clinical trial evidence with what he knows about the disease process. He said that when he is reviewing articles for publication in *Stroke*, he will reject papers that have very good statistics, but do not factor in biological plausibility. He said that it is biologically implausible to say that doing early anticoagulation is not helpful.[605] He said that there is no international consensus of opinion that would allow a clinician to delay the administration of anticoagulation therapy because it is recognised as needed immediately.[606]

438 In response to Associate Professor Lee's clinical opinion about the likely success of anticoagulation treatment for Kate on 2 December 2021, Professor Szoeke gave a reductive example of the usefulness clinicians saw in thalidomide in the 1950s and compared it to the value of Associate Professor Lee's clinical opinion.[607] Professor Szoeke did agree that treating CVST with anticoagulation is effective, even where there is bleeding. She said that 5% of patients with CVST who are given anticoagulation will still die. She did not address the likelihood of treatment at various points moving Kate from that 5% into the 95% who survive as she said she could not answer it categorically, but then went on to say that she could give a definitive answer.[608]

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[600] T855
[601] T861
[602] Exhibit C20 at 32
[603] Exhibit C20 at 33
[604] T787
[605] T859 and T884
[606] T888
[607] T782
[608] See T782-T783

439 I have been asked to accept that it was more likely than not that Kate was within the 5% of patients that do not survive this condition despite treatment. The difficulty with accepting that submission is that I am faced with the task of making a finding on the balance of probabilities. The 5% death rate represents a proportion of *all* patients presenting with the condition. The starting point must therefore be that it is far more likely than not that any person presenting with this condition will survive with treatment; that is, 95% of patients survive. An assessment therefore needs to be made about the factors that were said to exist that might draw Kate into that 5% range of patients. The question is not as simple as determining on the balance of probabilities whether Kate was within the 5% or not. The question is whether I am satisfied that Kate's death was preventable or inevitable. I am therefore required to weigh up whether she was within the very small category of non-survivable conditions. Given that it is such a small proportion of the overall cases, in my view, there need to be very clear indicators that she was within that 5% rather than the overwhelming majority of patients.

440 Another confounding factor is the progression of both time and condition. There was consensus amongst the experts that the condition is progressive. The picture is therefore not homogenous throughout the relevant times.

441 Even at the end of Kate's treatment, she had some of the factors said to put her into the non-survivable category, but not all. The most significant of those factors would not have been in existence at earlier times, as her condition was yet to develop.

442 I am therefore not satisfied, on the balance of probabilities, that Kate was within the 5% of patients who had an unsalvageable condition when she presented to the Sefton Park clinic and when she initially presented to TQEH. I am comfortably satisfied that in the earlier stages of her presentations, she was, on the balance of probabilities, within the overwhelming majority of patients who survive the condition with treatment.

443 Professor Szoeke was asked whether earlier treatment would have been addressing a clot that was less developed and less extensive. In answer, she agreed that the condition progresses over time but would not acknowledge that earlier treatment would be addressing an easier picture to deal with.[609] Associate Professor Hand said that there would definitely have been better chances of success if treatment was initiated on 2 December 2021, although his gut feeling was that the prognosis was still poor.[610]

444 Associate Professor Lee said that by the time Kate was at the RAH, anticoagulation therapy would be unlikely to prevent Kate's death because by that time herniation had occurred.[611] He also said that anticoagulation would not have been commenced at that point because, due to the herniation, a craniectomy had to be considered which could not occur together.[612]

445 Having reviewed the competing expert evidence, the overwhelming conclusion is that Kate's death was preventable. That is, she was dealing with a condition that is diagnosable on readily-available imaging and has clear treatments that have very good

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[609] T786
[610] T1019
[611] T922
[612] T926

success rates. The opportunities to prevent Kate's death which are clearly established on the balance of probabilities based upon the whole of the evidence were:

1. *Taking Kate to hospital on 2 December 2021 instead of the Sefton Park HASDS* - This would have involved the ambulance service correctly assessing the symptoms reported by Mrs Sylvia as of sufficient concern for her to be taken directly to hospital, or alternatively Dr Henderson being advised of those concerning features during the intake process and declining to accept Kate.

2. *Referring Kate to hospital from the Sefton Park HASDS on 2 December 2021* - This would have involved Dr Henderson referring Kate to hospital after either conducting a more in-depth neurological examination than he genuinely did and detecting the severity of her condition, or alternatively probing in more detail as to whether Kate had actually been diagnosed with migraine previously, or alternatively placing sufficient weight on Mrs Sylvia's statements about Kate's condition.

446 If either of those two opportunities set out above were taken, Kate would have been sent for a scan which, on the balance of probabilities, would have revealed abnormal intracranial pathology (either the haemorrhage or the CVST or both) which would then have led to an ultimate diagnosis. As discussed by the expert witnesses, this would have seen treatment administered to Kate by way of anticoagulation therapy, and if that did not work then thrombolysis, and then if that did not work thrombectomy and then potentially a craniectomy. Of course, if the opportunities listed above were taken up, these treatments would have been tried with a less-developed condition. As a basic unassailable proposition, clot retrieval would have been simpler if the clots were less developed.

447 Associate Professor Hand's evidence about the likelihood of Kate's condition being successfully treated has a great deal of applicability to the events at TQEH. In particular, he pointed out that anticoagulation and clot retrieval treatments were conducted in the early hours of 4 December 2021, but showed no positive response. Her symptoms had also dramatically developed. It is therefore more likely than not that Kate's condition in the day leading up to that was so far advanced that it would not have responded to treatment. I therefore find that even if Dr Duffield had declared a Code Stroke upon her assessment, or if Dr Barker and Dr Tew identified the CVST and brought it to Dr Raniga's attention, this would not have, on the balance of probabilities, prevented Kate's death.

448 The State made submissions that if I was to draw these conclusions, they would be illogical. They assert that the following is irreconcilable:

	2 December 2021	3 December 2021
Associate Professor Lee	Preventable	Preventable
Associate Professor Hand	Not preventable	Not preventable
My Finding	Preventable	Not preventable

449 As with witnesses generally, I am not obliged to accept the entirety of the opinion of any expert. I may accept parts and not accept other parts. I have endeavoured to provide my reasoning where that has occurred. In particular, I have explained the reasons why I have

not accepted the entirety of either Associate Professor Lee nor Associate Professor Hand's opinions.

450 In respect of the issue of preventability, I was particularly influenced by the evidence about the evolving nature of the condition. The fact that Kate's presentation worsened over time supports the assertion that her condition was evolving and worsening. Given the nature of the treatments available and the mechanisms they employ, it follows that treating the condition earlier will have greater chances of success.

451 It is against that background that I consider it proved, on the balance of probabilities, that Kate's condition would have been treatable and her death would have been preventable by that treatment on 2 December 2021 before it had reached such an advanced state. That finding is in line with Associate Professor Lee's opinion about 2 December 2021, but not in line with Associate Professor Hand's opinion.

452 Of course, Associate Professor Hand was asked to ignore the assertion by Mrs Sylvia that Kate had experienced clawing of her hand on 2 December 2021. I have found that she did. His opinion about preventability on 2 December 2021 is therefore not based on the facts as I have found.

453 However, I consider that by the time of 3 December 2021, Kate's presentation was of such severity, and by the time of her scans had developed to such a significant extent, that I am not satisfied, on the balance of probabilities, that her death could have been prevented. I consider that Associate Professor Lee's opinion about preventability on 3 December 2021 did not afford sufficient weight to the severity that the condition had reached by that point.

454 That my conclusion does not align entirely with any individual expert is a product of the specific circumstances, the evidence heard, and the manner in which experts approached giving evidence. I have reached conclusions that I consider are comfortably established on the evidence, and I have resisted conclusions where I am less sure that they were established.

Recommendations

455 I turn to consider what, if any, recommendations should be made in order to prevent the likelihood of future events of the same or similar nature occurring.

456 Mr Murchland explained that conversations with intermediate care facilities now occur directly between the clinic and the paramedics involved in the case.[613] He assumed that this has been done to avoid disruptions to the chain of information. Professor Kelly described this as a good thing.[614] She said the closer the conversation between the person with all of the information and the person who is making the decision to accept or not, the better. In light of this improvement, no recommendations are required about communication logistics when arranging intermediate care.

457 Issues were raised about the Code Stroke process; whether it should or should not have covered Kate's presentation and whether it would have resulted in any greater urgency

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[613] T226-T227 and T237
[614] T365

for her care. I consider that I have not received sufficient evidence to reach firm conclusions about that issue to the extent of making recommendations which might vary the Code Stroke processes.

458 Issues in respect of delays in transferring patients between hospitals were the subject of much evidence in the Inquest of *Panella, Skeffington and Jessett* [2025] SACC 21. Those Findings make clear that there has been a great improvement in inter-hospital transfers and no recommendations need to be made on that topic. I consider that no recommendations need to be made in respect of the issue of the availability of ambulances, which is also extensively discussed in that Finding.

459 In light of the evidence and the submissions made above, I make the following recommendations to the Minister for Health and Wellbeing, the Chief Executive of SA Health and the Chief Executive Officer of the SA Ambulance Service:

One That paramedics are reminded of, and routine training is updated to cover, the importance of not filtering information about patients, as everything found may have relevance to the clinician making the final diagnosis, even if it represents a key symptom that only forms part of the reported history and has not been personally observed by paramedics.

Two SA Health should expand HASDS' *exclusion* criteria to cover headaches with any different presentation than prior headaches and any migraine without a formally recorded prior diagnosis of migraine. There should be a general criterion for exclusion where the patient has the appearance of being seriously unwell.

Three That all SA Health clinicians are reminded and routine training is updated to cover:

a. That in dealing with severe headache, a report of prior diagnosis of migraine should be explored in detail to ensure that a genuine medical diagnosis had previously been made.

b. That when assessing for the presence of speech disturbance, clinicians should try to obtain a baseline from a family member or friend.

c. That collateral information about a patient's presentation is valuable, particularly reports that a person being neurologically assessed is not themselves.

d. That clinicians should not disregard key symptoms that are potentially transient and are only contained within reported history.

Four SA Health should give consideration to a program to allow family members in hospitals to escalate care where they consider concerns are not being taken seriously.

Condolences

460 As I have set out, Mrs Sylvia and the wider Sylvia family have lost a person who was deeply cared for and had a bright future ahead. A school lost a productive and respected librarian. The loss is a significant one. Kate's family told me that they have been 'consumed by overwhelming grief' since Kate's death. I can understand why.

461 I convey my sincere condolences to all those who felt the loss of Kate, most particularly her family.

Keywords: *CVST; Migraine; Intermediate Care; Hospital Treatment; Misdiagnosis*