HEALTH & DISABILITY COMMISSIONER
TE TOIHAU HAUORA, HAUĀTANGA

Delayed diagnosis of subarachnoid haemorrhage

1. On 21 July 2022, the Health and Disability Commissioner (HDC) received a complaint from Miss A regarding the care that her mother, Miss B, received from Health New Zealand | Te Whatu Ora Capital, Coast and Hutt Valley (Health NZ). Specifically, the complaint concerned the delay in diagnosis of a subarachnoid haemorrhage[1] after Miss B, aged 53 years at the time, presented by ambulance to Wellington Regional Hospital's Emergency Department (ED) on 27 January 2022. Miss B's daughter is concerned that clinicians assumed her mother's condition was caused by a drug overdose, preventing appropriate consideration of other causes.

2. Miss B passed away after this complaint was submitted. I extend my sincere condolences to her whānau for their loss.

Information gathered

3. On 27 January 2022, Miss B's son came home to find her lying in the garden, unresponsive. An ambulance was requested at 4.27pm and arrived at 4.35pm. A Glasgow Coma Scale (GCS)[2] score of 7 was recorded, indicating significant impairment of consciousness.

4. Ambulance staff were unable to find a clear cause for Miss B's state of reduced consciousness as there was no obvious evidence of a head injury, alcohol consumption, or prescription overdose (she had regular prescriptions for dihydrocodeine[3] and diazepam[4]). Whānau reported that they were not aware of any recent (non-prescription) drug use, and ambulance staff also noted that Miss B had been 'off methadone[5] now [for] many y[ea]rs.'

5. Noting that Miss B had a regular prescription for an opioid medication, her pupils did not dilate when shaded,[6] and drug paraphernalia was observed in the bedside table, ambulance staff administered naloxone[7] to reverse a possible opioid overdose. Miss B's awareness improved slightly after receiving the naloxone, so they administered a second dose. However, Miss B became agitated – fidgeting and making groaning noises – so ambulance staff administered droperidol[8] to help calm her. They recorded that she continued to show signs of agitation and remained non-verbal.

[1] A type of stroke characterised by bleeding in the space between the brain and the surrounding protective tissues.
[2] A test used to objectively assess a person's level of consciousness. A score of 15 indicates full consciousness, and a score of eight or below may indicate that the person is in a coma.
[3] An opioid medication used to treat moderate to severe pain.
[4] A type of benzodiazepine (a class of depressant) used to treat anxiety and seizures.
[5] An opioid prescribed as a substitution in the treatment of morphine and heroin addictions.
[6] Small pupils that do not dilate can be a symptom caused by consumption of opioids.
[7] A drug used to reverse the effects of opioids.
[8] Medication used for sedation and anti-nausea.

6. Miss B was triaged at Wellington Regional Hospital ED at 6.17pm. Health NZ told HDC that ambulance staff gave a handover to the ED registrar, Dr C, noting that the cause of Miss B's condition was unclear but that drug paraphernalia was found at the house and that small improvements in Miss B's level of awareness were observed after naloxone was administered. Miss B's son also provided information to hospital staff, including her methadone programme history but no known recent drug use.

7. Miss B's triage summary recorded the presenting complaint as 'O[ver]D[ose]/POISONING' and she was assigned an Australasian Triage Scale (ATS) of 2 (indicating suspicion of an imminently life-threatening condition for which the patient should be seen within 10 minutes).[9] It was also noted that Miss B remained non-verbal.

8. At 6.58pm, a nurse reviewed Miss B and confirmed that her airway was clear, and an improved GCS score of 11 was recorded. A reduced respiration rate was noted, but no other abnormalities were identified.

9. Retrospective clinical notes recorded at 7.11pm note that Dr C reviewed Miss B. All vital signs except her elevated blood pressure were noted as normal. Her GCS score remained at 11. Dr C's impression was that Miss B's presentation was consistent with an opiate or benzodiazepine[10] overdose. A plan was made to continue close monitoring of Miss B, and later that evening her care was handed over to another registrar, Dr D.

10. At 12.03am on 28 January 2022, Dr D discussed Miss B's condition with a senior medical officer. It was noted that Miss B had been making 'more purposeful movements', but she was still unable to engage in conversation. Health NZ told HDC that, because clinicians believed that Miss B's state was most likely drug induced, it was decided not to request a head computed tomography (CT) scan.[11] A plan was made to admit Miss B to the ED observation unit for continued overnight monitoring and to gain further information from her whānau when they arrived.

11. Miss B's daughter told HDC that she arrived at Wellington Regional Hospital at approximately 1am on 28 January 2022. She was told by a nurse that her mother had had a drug overdose. Miss B's daughter said she questioned this diagnosis, noting that all of her mother's prescribed medications were accounted for and that this had been confirmed by ambulance staff.

12. Throughout the night and early morning, Miss B repeatedly tried to get out of bed and remove her monitoring equipment. This behaviour was attributed to delirium, and droperidol was given to manage it. She also began to develop a fever during the night.

13. At 6.44am, Miss B's temperature peaked at 38.2°C. At this stage, Dr D considered that Miss B's condition did not fit the current working diagnosis of overdose/poisoning and could

[9] EDs in New Zealand use the ATS to guide the allocation of a triage score to each presenting patient to ensure appropriate prioritisation for treatment according to the urgency of the patient's condition. The ATS states that 80% of patients allocated triage code 2 should be seen within 10 minutes.
[10] A class of depressants used to treat anxiety, insomnia, and seizures.
[11] A scan that uses X-rays to create detailed internal images of the body.

instead be encephalitis[12] (which required a head CT scan for further investigation). Dr D noted there had been no improvement in Miss B's condition throughout her shift and that she remained non-verbal. She handed over to the morning registrar and recommended that a CT scan of Miss B's brain be performed.

14. A CT scan was completed at 9.21am and showed that Miss B had an acute subarachnoid haemorrhage, caused by a ruptured cerebral aneurysm.[13] The morning registrar referred Miss B to the neurosurgery unit, and she was taken to theatre at 11.47am for management of the ruptured cerebral aneurysm.

15. Sadly, Miss B experienced complications following neurosurgery and she passed away in August 2025. I again offer my sincere condolences to Miss B's whānau.

16. Miss B's whānau is concerned that it took more than 12 hours for ED staff to consider an alternate diagnosis. Health NZ acknowledged that there was a delay in diagnosing Miss B's subarachnoid haemorrhage and has apologised for this. Health NZ told HDC that the delay was caused by clinicians reaching 'early diagnostic closure' – the impression that Miss B's condition was due to a drug overdose – which stopped them from exploring other possibilities when her condition did not improve with time. Health NZ also noted that Miss B did not present with symptoms usually associated with subarachnoid haemorrhage, specifically, headache and collapse with coma.[14]

17. Health NZ was provided with a copy of the provisional report for comment. Health NZ has offered its sincere apology and acknowledged the distress Miss B and her whānau have experienced.

18. Miss B's whānau were provided with a copy of the provisional report for comment. They stated that their concern regarding Miss B being judged for her former drug use remains, and they hope that this investigation will remedy the cultural and systemic issues within the ED. Other comments have been integrated elsewhere in this report where relevant.

Independent advice

19. HDC sought independent clinical advice from an emergency medicine specialist, Dr Gary Payinda (**Appendix A**). Dr Payinda identified departures from accepted standards in the care provided to Miss B by Health NZ.

20. Dr Payinda stated that, given the history provided by ambulance staff, and noting Miss B's regular medications, it was reasonable for clinicians to initially consider that her presentation was most likely related to a drug/medication overdose. However, Dr Payinda was critical of the failure to adequately consider alternative diagnoses in a timely manner. He noted that substance use can, depending on the drug, increase a patient's risk of brain injury in several ways. Accordingly, patients in Miss B's condition should have further

[12] Inflammation of the brain, usually caused by infection.
[13] A weak and swollen area in a blood vessel in the brain.
[14] However, it should be noted that Miss B was found on the ground and unresponsive by her son on the afternoon of 27 January 2022.

diagnoses considered and investigations undertaken, even when a drug overdose is the primary working diagnosis. Noting the overnight delay before alternative diagnoses were explored, Dr Payinda considered this to be a moderate departure from accepted standards of care.

21. Dr Payinda was also critical of the delay in carrying out a head CT scan. He stated that when a patient presents with an unexplained and prolonged altered level of consciousness, it is expected that a head CT scan will be completed to investigate the cause. Dr Payinda said that deferring a CT scan by 'a few hours' is reasonable in cases where clinicians decide to observe and see whether the patient improves. In Miss B's case, noting that she did not improve and, on the contrary, was agitated such that she required sedation throughout the night, Dr Payinda considered that the time taken to order a CT scan (approximately 14 hours after presenting with impaired consciousness) was unreasonable. Dr Payinda considered this delay to be a moderate departure from accepted standards of care.

22. Dr Payinda noted that the repeated episodes of agitation requiring sedation throughout the night were red flags that should have prompted reconsideration of the working diagnosis and were missed opportunities to query whether the team was missing something, such as a brain infection, trauma, or bleed.

23. Dr Payinda noted 'anchoring bias'[15] as a contributing factor to the departures identified in this case. He recommended that ED staff receive training on this type of cognitive bias.

Opinion: Health NZ — breach

24. As a healthcare provider, Health NZ was responsible for providing services to Miss B in accordance with the Code of Health and Disability Services Consumers' Rights (the Code). Right 4(1) of the Code states that every consumer has the right to have services provided with reasonable care and skill. Based on the information gathered and Dr Payinda's advice, certain aspects of the ED care provided to Miss B clearly did not meet accepted standards of care, resulting in a significant delay in diagnosis and subsequent treatment for a subarachnoid haemorrhage.

25. Guided by Dr Payinda's advice, I am critical that ED clinicians did not appropriately consider and explore alternative diagnoses until the morning after Miss B's admission, even though her condition did not improve and she required medication for agitation. Additionally, Miss B did not receive a head CT scan until approximately 14 hours after presenting with an altered level of consciousness. I accept Dr Payinda's advice that this was an unreasonable delay.

26. Noting the timeframe over which the above departures occurred, and the fact that three ED doctors had oversight and/or input into Miss B's care over the relevant period, I consider that these departures reflect systemic issues. Health NZ has a responsibility to ensure that staff are trained and aware of what to do in such circumstances, specifically, the awareness of anchoring bias and the need to appropriately explore alternative diagnoses in a timely

[15] A type of cognitive bias in which people rely too heavily on the first piece of information received. This information becomes the 'anchor' from which subsequent decisions are influenced.

manner, the criteria for requesting a head CT scan when patients present with an altered level of consciousness, and acceptable timeframes for completion of that scan.

27. In light of the above issues in Miss B's care, which I consider resulted in care that did not meet reasonable and accepted standards, I find that Health NZ breached Right 4(1) of the Code.

Recommendations and follow-up actions

28. I recommend that Health NZ Capital, Coast and Hutt Valley:

a. Provide a formal written apology to Miss B's whānau for the issues identified in this report. The apology is to be sent to HDC within three weeks of the date of this report for forwarding to Miss B's whānau;

b. Develop a guideline (or if appropriate amend an existing policy) for ED staff for the management of patients presenting with an altered mental state or delirium. This should include an outline of symptoms that warrant an immediate head CT scan, observation requirements, and referral and discharge criteria. A copy of this guideline, in addition to any related training provided to staff, is to be provided to HDC within six months of the date of this report; and

c. Provide a training session to ED doctors covering cognitive biases (including anchoring bias). Evidence of this training and staff attendance is to be provided to HDC within six months of the date of this report.

29. A copy of this report with details identifying the parties removed, except Health NZ Capital, Coast and Hutt Valley and Wellington Regional Hospital, and my clinical advisor, will be sent to the Australasian College for Emergency Medicine and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Dr Vanessa Caldwell
Deputy Health and Disability Commissioner

Appendix A: Independent clinical advice to Commissioner

The following independent advice was obtained from emergency medicine specialist, Dr Gary Payinda:

Independent clinical advice to Health and Disability Commissioner

Complaint:	**Miss [B]**
Our ref:	**C22HDC01774**
Independent advisor:	**Dr Gary Payinda**

I have been asked to provide clinical advice to HDC on case number C22HDC01774. I have read and agree to follow HDC's Guidelines for Independent Advisors.

I am not aware of any personal or professional conflicts of interest with any of the parties involved in this complaint.

I am aware that my report should use simple and clear language and explain complex or technical medical terms.

Qualifications, training and experience relevant to the area of	MD FACEM (Fellow of the Australasian College for Emergency Medicine), currently practicing as an emergency medicine specialist.
Documents provided by HDC:	• Complaint dated 21 July 2022 • Health NZ's response dated 24 August 2022 • Wellington Free Ambulance response dated 5 September 2022 • Clinical records from Health NZ covering the relevant period • Clinical records from Wellington Free Ambulance covering the relevant period • Relevant Health NZ policies
Referral instructions from HDC:	1. Whether Miss [B]'s initial assessment and management in ED met accepted standards. As part of this, please comment on diagnostic formulation and differential diagnosis. 2. Whether it was reasonable to consider Miss [B]'s presentation as being most likely drug related, including whether alternative diagnoses were adequately considered and investigated during her period of observation under the ED team. 3. Whether it was consistent with accepted practice for Miss [B] to remain under the care of the ED team until her brain CT was performed. 4. Any other matters that warrant comment or amount to a departure from accepted standards, in relation to Miss [B]'s management while under the care of the ED team.

Factual summary of clinical care provided complaint:

Brief summary of clinical events:	Miss [B], a 53-year-old woman, was found outside her home with an altered level of consciousness due to an unknown cause. She had a distant history of substance abuse ending a decade earlier and was on a narcotic painkiller and a benzodiazepine sedative as regularly prescribed medications. The cause of her altered mental status was unknown. She'd shown slight improvement with naloxone, an opioid-reversal agent, but continued to be delirious in ED, with her agitation severe enough to require sedation, as she was pulling out her IV and biting through tubing, despite being unable to speak or follow commands. This agitation and profound confusion continued overnight. In the morning, when she still hadn't improved, her clinicians re-considered their initial diagnosis of overdose-induced delirium and obtained a head CT, which showed a subarachnoid haemorrhage. Several hours later, she was taken to theatre for management of a ruptured cerebral aneurysm. Her family, in their complaint, said they were concerned that her treatment may have been delayed due to prejudice over her past substance abuse issues. Her clinicians denied prejudice but acknowledged the delay should not have happened and was due to 'anchoring bias': their belief that the patient's delirium was likely due to drugs or medication overdose, and continued reliance overnight on that initial impression, rather than reassessment and consideration of other causes such as intracranial haemorrhage, when her condition failed to improve.

Question 1: Whether Miss [B]'s initial assessment and management in ED met accepted standards. As part of this, please comment on diagnostic formulation and differential diagnosis.	
List any sources of information reviewed other than the documents provided by HDC:	None
Advisor's opinion:	The patient's assessment in ED did not meet accepted standards. There was an overnight delay in obtaining a head CT, which is part of the ED assessment of a patient with an altered level of consciousness, especially one with prolonged/persistent symptoms including agitation (requiring repeated sedation

	overnight) as well as ongoing aphasia (inability to speak) and confusion, over a course of approximately 14 hours.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/ material.	The standard of care is to obtain a head CT in the case of an unexplained and prolonged altered level of consciousness. While deferring head CT for a brief period of time is reasonable to avoid the harms of unnecessary imaging, including radiation harm, and to assess if the patient is spontaneously improving, the timeframe would typically be a few hours rather than 14 hours. This is based not on hard evidence or a written guideline but commonly accepted ED practice. The emergency medicine studies I am aware of regarding deferring CTs usually involve patients who are clearly alcohol intoxicated, where a brief (0- to 2-hour) observation period is reasonable, because the patient is expected to improve. Avoiding an unnecessary CT in these cases is desirable. In this patient's case, however, such a management plan wouldn't apply, as the patient was not alcohol intoxicated. The differential diagnosis for the patient would have included drug intoxication or medication overdose, CNS [central nervous system] infections (such as meningitis or encephalitis), traumatic brain injury (such as a brain contusion or subdural haemorrhage), and haemorrhagic stroke/intracranial haemorrhage/subarachnoid haemorrhage. Less likely are brain masses, medical conditions that increase intracranial pressure, or even rarer conditions like anti-NMDA receptor encephalitis. In my professional opinion, overdose would have been at the top of the differential (as the most likely cause of altered mental status), especially as the patient was on a prescription opioid and a prescription sedative, but as time passed and the delirium and agitation continued, one would have had to more strongly entertain the possibility of other aetiologies and seek imaging and/or lumbar puncture to help reach a diagnosis. This eventually did occur, the following morning.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or	Moderate departure. The care provided did not meet a particular standard or accepted practice, but there were relevant mitigating factors present and considered.

• Severe departure.	
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	My peers would have a range of approaches, ranging most commonly from a prompt CT without delay, to a brief delay (perhaps a few hours) for observation to assess for improvement. But not longer than that, especially in the case of severe agitation requiring re-sedation.
Please outline any factors that may limit your assessment of the events.	None
Recommendations for improvement that may help to prevent a similar occurrence in future.	While the clinicians provided ED guidelines on the management of headache, and subarachnoid haemorrhage, what would have been preferable is an ED guideline for the management of altered mental status or delirium, covering the signs and symptoms that warrant immediate head CT, recommendations regarding ED observation, and referral or discharge criteria. Strongly advised is a recurring RMO/SMO teaching session that covers cognitive biases such as anchoring bias. This is a type of bias that clinicians cannot eliminate but can mitigate.

Question 2: Whether it was reasonable to consider Miss [B]'s presentation as being most likely drug related, including whether alternative diagnoses were adequately considered and investigated during her period of observation under the ED team.	
List any sources of information reviewed other than the documents provided by HDC:	None
Advisor's opinion:	As discussed in the answer to Question 1, it is indeed reasonable to initially consider the patient's presentation as being most likely drug- or medication-overdose related, especially given there was ambulance staff documentation that glass pipes/paraphernalia were found on the patient's premises, the patient's history of prior opiate abuse, and her current history of prescription opioid and sedative use. To consider it likely, however, does not preclude the clinician from considering other alternatives (and forming a 'differential diagnosis'). ED clinicians understand that 'intoxication' should

	not be over-relied upon as the sole cause of a patient's altered mental status. In fact, substance use or intoxication actually increases a patients' risk of other secondary disease processes. For example, alcohol intoxication raises a patient's risk of trauma, methamphetamine use raises one's risk of an intracranial haemorrhage, and opiates of a hypoxic brain injury. An intoxicated patient cannot be assumed to be merely intoxicated – they may well be intoxicated and have a medical or surgical emergency in addition. Hence why common ED practice would be to obtain a head CT in the lethargic or agitated patient whose condition is not clearly improving over a couple of hours, especially in a patient whose irritability and aphasia and agitation are persistent for many hours, at times requiring repeated chemical sedation.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/ material.	Some ED clinicians would obtain a head CT immediately. Some would defer imaging to allow a brief period of observation. This brief ED observation period is not a hard and fast rule. Perhaps a few hours. But I do believe 14 hours would be seen as overly permissive, or incautious, by my peers. Especially due to the features mentioned above. I think it's likely that the clinicians involved would agree that if they could do this again, they would choose to CT earlier in the evening rather than the following morning.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	Yes, a moderate departure from accepted practice. The alternative diagnoses were not adequately considered and investigated during her time in the ED. They were eventually considered, but only after an unacceptable overnight delay. It's a moderate departure, not a severe departure, because there were relevant mitigating factors as discussed above.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	See above. I did consult several peers with hypothetical cases. Some said they would CT immediately, while others said they would wait 'a few hours'. But none would have deferred imaging overnight in light of ongoing agitation requiring repeated IV sedation. As one peer pointed out, it's possible for a patient with altered mental status to have had a brain injury that is not clinically

	apparent (ie, not leaving bruising or bleeding on the scalp), especially if the patient has been found on the ground and no further history is obtainable. In these cases, head CT may be the only way to diagnose a cerebral contusion or haemorrhage. I do think that, after the overnight delay to head CT, there was an appropriate consideration of a differential diagnosis the following morning, when ongoing agitation was thought to be potentially due to encephalitis (inflammation/infection of the brain) and a plan was made for a head CT and an LP [lumbar puncture], if necessary. This led them to obtaining a head CT (prior to the LP) and diagnosing the subarachnoid haemorrhage.
Please outline any factors that may limit your assessment of the events.	None.
Recommendations for improvement that may help to prevent a similar occurrence in future.	See above answer to Q2

Question 3: Whether it was consistent with accepted practice for Miss [B] to remain under the care of the ED team until her brain CT was performed.	
List any sources of information reviewed other than the documents provided by HDC:	None
Advisor's opinion:	Yes, it was reasonable for the patient to remain under the care of the ED team until her head CT was performed. One could argue that ED staff expertise and availability could actually have been more robust in ED than on a neurological ward or admissions/holding unit overnight. There was evidence that the patient's agitation received frequent ED reassessments and doctor management overnight (albeit with sedation, rather than sedation + imaging, unfortunately). While earlier imaging would have been preferable, I don't think the patient would have necessarily received different or better care elsewhere in the hospital.

	Anchoring bias could have occurred in another unit or department as well.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	I think remaining in ED overnight was not unreasonable and was within the standard of care. If there were issues of understaffing or overcrowding that didn't allow a prompt admission from ED, that would be a separate issue that could be looked at in its own right, but I don't think it would reflect on how this patient's care unfolded.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	No departure
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	As reasonable.
Please outline any factors that may limit your assessment of the events.	None
Recommendations for improvement that may help to prevent a similar occurrence in future.	None

Question 4: Any other matters that warrant comment or amount to a departure from accepted standards, in relation to Miss [B]'s management while under the care of the ED team.	
List any sources of information reviewed other than the	None

documents provided by HDC:	
Advisor's opinion:	Other matters that merely warrant comment but do not add or subtract from the comments in the sections above: I think it is good that the treating ED doctor noted '??opiate dependency, second hand info', alerting the reader that the information was not definitive or proven, but second-hand. This is, I believe, an attempt to show that the natural tendency to 'anchoring bias' was being actively considered and partially mitigated against. As ED doctors, we shouldn't hesitate to document what we're being told (about glass pipes or paraphernalia or other historical features) but also documenting when this information is second-hand, or unreliable, or based on conjecture. In this case, an ED clinician also documented that there were no track marks and no 'used packets' of drugs found, nor empty canisters of medications, which I believe are all evidence that the clinician was trying to avoid premature closure or anchoring bias. It's worth noting that a response, or partial response, to naloxone is not definitive evidence of an opioid overdose. A patient who remains obtunded (having a reduced level of alertness) or agitated may require imaging or further investigation. In this case, the ambulance staff's naloxone administration seemed to very transiently improve pupil size (1mm to 4mm) and mental status (GCS 7 to 10). A broader workup for other, non-overdose, causes of delirium eventually occurred after an overnight delay. One missed red flag was that the patient was repeatedly requiring sedation for severe agitation overnight. Each of these episodes was an opportunity to re-consider whether the team was missing something, such as a brain infection, trauma, or bleed.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	As above no additional comment.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure;	No

• Moderate departure; or • Severe departure.	
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	N/A
Please outline any factors that may limit your assessment of the events.	None
Recommendations for improvement that may help to prevent a similar occurrence in future.	None.