HEALTH & DISABILITY COMMISSIONER
TE TOIHAU HAUORA, HAUĀTANGA

A Decision by the Deputy Health and Disability Commissioner

(Case 23HDC03316)

Introduction

1. This report is the opinion of Carolyn Cooper, Deputy Health and Disability Commissioner, and is made in accordance with the power delegated to her by the Commissioner.

2. The report discusses the care provided to Mrs A by Ōamaru Hospital (operated by Waitaki District Health Services Limited (WDHS) at the time of these events[1]).

3. On 4 December 2023 this Office received a referral from the Coroner about the care provided to Mrs A by Ōamaru Hospital. The complaint concerns a prescription/ administration error of hypertonic saline.[2]

4. The following issues were identified for investigation:

- *Whether Waitaki District Health Services Limited provided Mrs A with an appropriate standard of care across two consecutive days in November 2023;*
- *Whether Dr C provided Mrs A with an appropriate standard of care across two consecutive days in November 2023;*
- *Whether RN D provided Mrs A with an appropriate standard of care across two consecutive days in November 2023.*

5. The parties directly involved in the investigation were:

Waitaki District Health Services	Provider
Dr C	Senior medical officer/provider
RN D	Registered nurse/provider
RN E	Registered nurse/provider

6. Independent clinical advice was obtained from senior medical officer and rural medicine specialist Dr Johan Peters (Appendix A) and Clinical Nurse Manager (CNM) Therese Manning (Appendix B).

[1] Ōamaru Hospital was operated by Waitaki District Health Services Limited (WDHS) at the time of these events. On 1 July 2024, Health NZ | Te Whatu Ora (Health NZ) ended its contract with WDHS, and now Health NZ Southern is managing the delivery of services at Ōamaru Hospital.
[2] Used for the treatment of hyponatraemia (a low concentration of sodium in the blood).

Background

7. Mrs A (aged 93 years) was referred by her general practitioner (GP) to Ōamaru Hospital Emergency Department (ED) in early November 2023 due to severe hyponatraemia,[3] along with a chesty cough.

8. Mrs A was seen by Dr B,[4] who diagnosed Mrs A with pneumonia, severe hyponatraemia, and urinary retention. Dr B prescribed a bolus of 100ml of 3% hypertonic saline (saline) at a rate of 200ml per hour with a target of 116–118mmol/L for the sodium that night with a further check scheduled at 9pm. He said that he asked nursing staff to restrict Mrs A's fluids to 750ml/day.

9. Dr B's shift finished at 7pm, and Mrs A's care was handed over to Dr C (SMO[5]), who was working the night shift. Dr C told the Health and Disability Commissioner (HDC) that it was a busy shift[6] and he was the sole doctor on for the rest of the shift at the time Mrs A's care was handed over to him. He was responsible for attending to and managing all new presentations, as well as managing existing ED and ward patients.

10. Dr C said that a few hours later, the nurses told him that the saline course had finished, and that Mrs A's current sodium level was up to 119mmol/L (up from 112).[7]

Administration error

11. RN D (shift leader) told HDC that the ED was busier than usual, with 15 patients needing assessment, triage, monitoring, and treatment.

12. RN D said that he gave Mrs A her prescribed medications at 7pm.[8] In terms of the 3% saline that had been prescribed by Dr B, he needed to source this, as it is not something that is usually used in ED. The saline he located was in a 1000ml bag. He showed this to CAP[9] nursing student Ms F[10] for checking and was advised by her that the fluid prescription chart should read '1000ml' not '100ml'. RN D said that he did not question this as he assumed that Ms F had discussed this with Dr B previously, and that Dr B had made an error in charting

[3] Abnormally low concentration of sodium in the blood.
[4] Dr B was working as a locum Emergency Medicine specialist at Ōamaru Hospital across six days in early November. Dr B stated that it was his first time working at Ōamaru Hospital.
[5] Senior medical officer.
[6] WDHS accepted that the ED was busier than usual and that there are 10 beds in the ED. However, at the time of Mrs A's admission there were 12 patients in ED and 15 inpatients in the ward, for whom Dr C was also responsible.
[7] The result was recorded at 9.23pm.
[8] RN D was working the afternoon shift starting at 2.45pm and finishing at 11.15pm. WDHS told HDC that RN D was responsible for administering medications to patients in the ED and providing direction and delegation to the healthcare assistant and CAP student. As shift leader, he was also responsible for the coordination and the patient flow in and out of the department and dealing with any staffing issues that arose on shift.
[9] Competence Assessment Programme.
[10] At the time of these events, Ms F was a CAP nursing student through the Otago Polytechnic CAP student programme, working under supervision. The Otago Polytechnic fluid administration and preparation guide states that a CAP student may sign off on fluids as a second checker and can administer IV fluids under the direct supervision of an RN.

'100ml' rather than '1000ml', particularly as the rate of administration was charted as 200ml/hr rather than 100ml over 30 minutes.

13. RN D said that an ED doctor needed to change the fluid prescription chart. Dr C was not available immediately, so RN D went to check on another patient and told Ms F to start the administration of saline (commenced at 7.30pm), expecting the chart to be amended when Dr C was available.

14. RN D told HDC that while the saline was being administered, Ms F notified him of some concerns she had with Mrs A, but RN D told her to discuss these with Dr C, which she did, with Dr C confirming to continue with the current treatment.

15. RN D said that he did not have any further involvement with Mrs A and was unaware that the fluid chart had not been amended.

Ms F's version of events

16. Ms F has provided a different version of events. She said that she was unfamiliar with 3% saline administration, and she asked RN D for clarification. Ms F attempted to contact Dr B and Dr C, but they were not available. Ms F said that she thought that RN D had received clarification when administration of the saline solution was commenced. She said that she did not discuss the dose with Dr B, as stated by RN D.

17. Ms F told HDC that she consulted RN D about Mrs A's blood pressure and queried whether the administration of saline should continue. Ms F is unsure whether RN D told Dr C about Mrs A's blood pressure at the time. Ms F said that she told Dr C about it later.

Night shift

18. RN E[11] came on night shift and recalled the handover meeting at around 11pm. She said that Dr C, RN D, Ms F, and others were present. Regarding Mrs A, she said that the handover confirmed that 'there was a one litre 3% saline currently running and to put up a second litre of 3% saline after the first bag was finished. The second bag had already been charted.' Staff were also advised at handover to maintain a fluid intake/output chart and undertake blood pressure monitoring, and that Mrs A had a fluid restriction (750ml per day) and was on IV antibiotics and on oxygen via a nasal cannula.

19. RN E told HDC that it was a busy shift, and the ED does not have a healthcare assistant, receptionist, or cleaning staff at night, and usually the nursing staff must complete this work in addition to their nursing duties. As shift leader, she also had to complete acute admission paperwork, trolley checks, and filing work, undertake cleaning, replace equipment and attend call bells. In addition to caring for the patients already in ED at the start of the night shift, RN E triaged and cared for an additional two patients who arrived during her shift (one arrived around midnight and the other at around 5.00am).

[11] RN E was shift leader. She told HDC that the ED has two nursing staff on each shift, and she took responsibility for Mrs A and another patient.

Prescription error

20. Dr C said that he was not overly familiar with prescribing 3% saline, and with no hospital guidelines or policies for reference, he prescribed a 3% saline 1000ml bag to run over 10 hours, which he believed to be a rate that was slower and 'more cautious'. He said that he requested that the sodium level be checked again in a few hours.[12] Dr C stated that his reasoning was to 'steadily increase [Mrs A's] sodium levels into the 120s'. Dr C told HDC that at no time did any staff raise issues with his prescription.

Monitoring

21. Mrs A was checked at the start of the shift (11.15pm). She was awake and her breathing had an 'audible crackle sound', but she was alert and orientated. Her blood pressure was high (200/70mmHg), and she was given medication for this by Dr C, which was charted. RN E emptied the catheter (900ml) and noted that Mrs A was coughing occasionally and bringing up purulent sputum.[13]

22. RN E said that at around 12.40am Mrs A's infusion pump started to beep, and, as the first 1000ml bag was finished, she followed the plan she had been told at handover. She replaced the saline with another 1000ml 3% saline bag to run at 100ml/hr, which had been charted by Dr C.[14] This was checked by RN G, and they both signed the fluid prescription chart. Mrs A's blood pressure was recorded as 103/55mmHg at 12.49am and 139/48mmHg at 1.02am.

23. RN E stated that there was a meeting with Dr C to discuss a new admission. A nurse reported to Dr C that Mrs A's breathing sounded 'wet and crackly'. Dr C was told about Mrs A's blood pressure and urine output, but there was no change to the treatment plan.

24. At 4.15am, RN E emptied 1600ml of urine from Mrs A's catheter bag. RN E told HDC that the audible crackle was still present, but she did not observe any deterioration in Mrs A's condition. RN E accepted that due to workload, Mrs A's respiratory rate[15] was not recorded, and nor was the Early Warning Score (EWS)[16] calculated.

25. RN E told HDC that she is unfamiliar with prescribing and administering 3% saline. She stated that 'Notes on Injectable Drugs' (NoIDs) and the Medsafe data sheet (discussed below) do not give guidance on the amount of saline to be administered.[17] She said that she did not realise until after these events that 100ml had been replaced with 1 litre by the previous shift.

[12] RN E does not recall a direction regarding a further test of sodium levels.
[13] Thick sputum containing pus.
[14] RN E told HDC that it was charted that this was to be at a rate of 200ml per hour, but this was accompanied by the instruction at handover that 1000ml was to be administered initially.
[15] There is no documentation of respiratory rate after 9.15pm.
[16] The national vital signs chart and EWS provide a safety net for adult patients who deteriorate acutely while in hospital. The New Zealand EWS is calculated from routine vital sign measurements and increases as vital signs become increasingly abnormal. The EWS triggers an escalating clinical response so that clinicians can intervene and manage the patient's deterioration. This was not documented until 8.40am, shortly before Mrs A passed away.
[17] In response to the provisional opinion, RN E stated that she did not refer to Medsafe. HDC understands this to mean that she did not refer to Medsafe guidance at the time of this event.

Subsequent events

26. Dr C said that shortly before morning handover, Mrs A's sodium levels had risen to 142. Dr C realised that this rise was too rapid, and he instructed the nurses to stop Mrs A's fluids immediately. At this time, Dr C thought that Mrs A had received 700–800ml over a 10-hour period.

27. Dr C said that he observed that Mrs A was alert and eating breakfast but was short of breath. She did not show any clinical effects from the fluid correction, and Dr C considered that she was still struggling with the effects of severe pneumonia. He requested that Dr B review Mrs A first when he started his shift.

28. Dr B started his morning shift at 8am. Mrs A's blood tests showed a sodium level of 142.[18] Dr B said that he saw two empty 3% saline bags (one empty, one partially empty). The fluid prescription chart recorded that Mrs A had been given 1000ml of saline as opposed to the 100ml that Dr B had prescribed.

29. Dr B commenced reversing the sodium correction by giving 1000ml of 5% dextrose[19] and potassium. He requested that desmopressin[20] be sourced. He rang the medical registrar at Dunedin Hospital to discuss the treatment plan. After this call, Mrs A became unresponsive. Dr B noted that Mrs A was too frail for aggressive treatment, and recent notes suggested that this was not appropriate. Mrs A was provided with comfort care, and she passed away a short time later.

30. A postmortem was conducted two days later, with the cause of death stated as pneumonia and sepsis. Vitreous sodium levels indicated that hyponatraemia had been corrected, and no pontine myelinolysis[21] was identified, which suggested that sodium correction had not been overly rapid.

31. WDHS staff reported the case to Te Tāhū Hauora Health Quality & Safety Commission (HQSC) two days after Mrs A died. Initially this was given a provisional severity assessment code (SAC) 1,[22] but subsequently it was given a final SAC 2[23] rating.

Dr C's response

32. Dr C stated that while he considers that Mrs A succumbed to severe pneumonia, he accepts that he overprescribed a hypertonic solution that should have been administered more judiciously and much more slowly, with closer monitoring of her electrolytes. On reflection, an alternative approach would have been not to prescribe any further fluids and to focus on continuing to manage her severe pneumonia, in the hope that it would lead to a gradual sodium correction.

[18] Recorded at 7.43am.
[19] A form of glucose.
[20] Reduces urine production.
[21] Damage to areas of the brain.
[22] SAC is a rating and triage tool for adverse event reporting, as set out by the HQSC. SAC 1 refers to death or permanent severe loss of function.
[23] Permanent major or temporary severe loss of function.

33. Dr C accepts that he was unfamiliar with prescribing hypertonic solution. He did not take time to assess his prescribing decision comprehensively and had no guidelines to refer to, which led to poor decision-making that fell short of his own clinical standards. He also accepts that even though it was busy, he missed the opportunity to look up guidelines from other online sources and to seek guidance from hospital specialists in Dunedin.

RN D

34. RN D told HDC that he is extremely sorry for the error in administration of saline and has taken steps (discussed below) to ensure that this does not happen again. RN D stated that this is the first medication error he has been involved in during his career, which has been spent focusing on serving the community and striving to provide the best care possible.

WDHS/Health NZ

35. WDHS told HDC that it accepts that the ED was busy at the time of these events and that Dr C was the sole doctor covering Ōamaru Hospital on night shift and was responsible for all ED patients, the acute medical/ward patients, arranging transfers, speaking to consultants at Dunedin Hospital, and taking phone calls from nursing homes, as Ōamaru Hospital provides all urgent care to the region after hours. The night doctor is also responsible for any emergencies that may occur on the maternity ward. There is no formal second-on-call roster at Ōamaru Hospital.

36. WDHS told HDC that at the time of these events, it had in place an 'Intravenous Fluid and Medication manual'[24] and a 'Medication and Fluids/Policy Procedure'[25]. These documents provide clear direction regarding responsibility for administration of medication, and the need for any change to a prescribed dose to be verified by a medical practitioner prior to being implemented, and unfortunately the verification did not occur due to staff workload. WDHS acknowledged the pressures on staff at the time due to high patient numbers in a small rural ED.

37. WDHS stated that while Dr C may have been unfamiliar with the rarely used 3% saline solution, there were relevant guidelines and resources available to support clinical decision-making, including 3% sodium chloride solution.[26] This includes the NoIDs[27] and the Medsafe data sheet, which both contain specific information on 3% sodium chloride, including warnings against too-rapid administration. However, WDHS accepted that there is a potential

[24] WDHS told HDC that this document was accessible to staff via SharePoint on computers located in the ED. Staff also had access to the Medsafe data sheet on sodium chloride.

[25] A WDHS policy that provides details around responsibility for prescribing and administration decision-making. WDHS also had in place a 'Student Nurse and Competence Assessment Program (CAP) candidates — Fluid and Medication Preparation and Administration Guide' (August 2023).

[26] WDHS told HDC that at the time of the incident, 3% sodium chloride was stored in a separate storeroom from 0.9% sodium chloride solution and is contained within a clearly labelled hypertonic fluid box to ensure that care is taken when accessing 3% sodium chloride for administration.

[27] A guidance document issued by the New Zealand Hospital Pharmacy Association. WDHS told HDC that a hard copy of this document was available to medical and nursing staff in the ED resuscitation room at the time of Mrs A's admission and includes notes on 3% saline. An electronic copy of the 2022 document is available online via Midas (Health NZ Southern's SharePoint system, to which WDHS had a direct link via the internal SharePoint system).

gap in information around the volume/administration of 3% sodium chloride solution that is not covered by NoIDs, and work is being undertaken to remedy this.

38. Being part of a small rural hospital, WDHS staff also have the option of liaising with Dunedin Public Hospital staff to guide their decision-making around patient management. This is supported by the WDHS Medication and Fluid Policy/Procedure, which contains contact details of the Dunedin Public Hospital pharmacy for medication-related issues. The availability of Dunedin Public Hospital staff as a resource is also demonstrated by the remedial steps taken by Dr B. Staff also have access to the online resource 'UpToDate' via all computers, as well as Canterbury Health pathways, which was another resource available at the time.

39. Regarding student supervision, WDHS told HDC that Ōamaru Hospital utilised Health NZ Southern policies,[28] which provide clear guidance on student supervision. WDHS recognises the need to ensure that all students are supervised appropriately.

40. In addition to the policies described above, WDHS told HDC that nurses are required to obtain and maintain 'Basic IV certification' on commencement of employment with WDHS, with completion of online competency modules at a minimum of three-year intervals.

41. Following Mrs A's case, WDHS investigated the possibility of ordering a supply of 100ml bags of 3% saline, to use in place of the 1000ml bags. However, WDHS understands that bags of that size are not available for supply in New Zealand.

Responses to provisional opinion

Mrs A's family

42. Mrs A's family was provided with the opportunity to comment on the 'information gathered' section of the provisional opinion, and they advised that they had no comments to make.

Dr C

43. Dr C was provided with the opportunity to comment on the provisional opinion, and he advised that he had no comments to make.

RN D

44. RN D was provided with the opportunity to comment on the provisional opinion, and he advised that he accepts the findings made.

RN E

45. RN E was provided with the opportunity to comment on the provisional opinion, and her comments have been incorporated throughout the report where relevant.

WDHS/Health NZ

46. WDHS and Health NZ were provided with an opportunity to comment on the provisional opinion. Health NZ advised that it accepts the recommendations as set out below.

[28] Staff responsibility for student placements — Nursing & Allied Health Scientific and Technical (District) MIDAS — 26956 and Clinical responsibilities handbook for Bachelor of Nursing students.

Opinion: Dr C, RN D, RN E, WDHS

47. First, I acknowledge the distress that these events have caused Mrs A's family. I take this opportunity to extend my sincere condolences to Mrs A's family for their loss. After careful review of the information gathered over the course of this investigation, I have concerns about the care provided to Mrs A both from individual staff and from WDHS, as outlined below.

Dr C — adverse comment

Prescribing error

48. Dr C was the sole doctor on the night shift during Mrs A's admission. He told HDC that he was unfamiliar with prescribing hypertonic solution. Despite this, Dr C prescribed a 3% saline 1000ml bag to run over 10 hours. Dr C accepted that he did not look up guidelines from other online sources or seek guidance from hospital specialists in Dunedin.

49. My independent advisor, Dr Peters, stated that appropriate guidelines were in place at Ōamaru Hospital. However, he advised that the workload (shift numbers and complexity volumes) at the time of Mrs A's admission was at the limit of what can be considered safe. Despite this, the requirement remains to prioritise patient care adequately and to be aware of red flags in patients who need further consideration. Severe hyponatraemia in a severely ill elderly respiratory patient is such a red flag, and ultimately Mrs A's care was the responsibility of Dr C despite his suggestion that staff did not raise concerns on reading his prescription.

50. Dr Peters concluded that due to the workload at the time, and because the postmortem results confirmed that the hyponatraemia management did not cause Mrs A's death, Dr C's actions can be considered a moderate departure from the accepted standard of care.

51. I accept this advice. Dr C had a busy workload, which I will discuss further in the report, and this contributed to his decision-making regarding Mrs A's management. Nevertheless, Dr C has accepted that he was unfamiliar with prescribing hypertonic solution and that he should have consulted the appropriate guidelines available to him, and I am concerned that this did not occur.

RN D

Administration error — adverse comment

52. RN D was the shift leader, and, along with CAP student Ms F, administered an incorrect amount of 3% saline to Mrs A.

53. My independent advisor, CNM Manning, accepted that RN D had a heavy workload at the time of Mrs A's admission and was also responsible for supervising Ms F. It is also accepted that RN D was unfamiliar with the administration of 3% saline. CNM Manning stated that it is accepted practice that medication should be administered as prescribed, and if there is a concern that the prescription is incorrect, then the correct dose should be clarified prior to administration, which did not occur in this instance. CNM Manning concluded that this was a moderate departure from accepted practice.

54. Given RN D's and Ms F's differing versions of events, I am unable to make a finding on what was discussed between them. However, CNM Manning stated that ultimately RN D was responsible for the supervision of Ms F. I accept this advice. As I have noted above, RN D had a heavy workload and was unfamiliar with the administration of 3% saline. However, if he was unsure of the prescription, he should have taken steps to check the correct dose, and I am concerned that this did not occur.

Supervision of Ms F — adverse comment

55. As noted above, RN D was responsible for the supervision of Ms F as well as attending to his duties as shift leader. Following the discussion regarding the correct prescription of 3% saline, RN D went to check on another patient and told Ms F to start the administration of saline, expecting the chart to be amended when Dr C was available.

56. CNM Manning advised that CAP nursing guidelines for Ōamaru Hospital clearly document that all fluids and medications must be prepared and administered under the direct supervision of an RN. In this instance, Ms F took responsibility for the care of Mrs A in overseeing the ongoing administration of the (incorrect) amount of 3% saline when the prescription had not been confirmed as incorrect and changed. As Ms F was under the supervision of RN D, it should have been RN D's responsibility to ensure that the prescription was correct before it was commenced. CNM Manning concluded that this was a mild departure from the accepted standard of care.

57. I accept this advice, and I am concerned that Ms F did not have adequate supervision. As acknowledged above, RN D had a heavy workload, and I will discuss this further below. However, I consider that RN D's ability to supervise Ms F adequately was directly impacted by his workload, and this needs to be taken into consideration when assessing the standard of care he provided to Mrs A.

RN E — educative comment

58. RN E was the shift leader on the night shift. RN E accepted that due to workload, Mrs A's respiratory rate was not recorded after 9.15pm, and nor was the EWS calculated until shortly before Mrs A passed away. RN E accepted that she was unfamiliar with the prescription and did not realise the administration error until after Mrs A had passed away.

59. CNM Manning advised that calculation of the EWS provides a safety net for patients who deteriorate acutely while in hospital, and potentially Mrs A's deteriorating condition could have been noticed earlier had her respiratory rate been assessed and documented with an accurate EWS calculated. CNM Manning considered this omission to be a moderate departure from the accepted standard of care, with a mild departure in not checking that the fluids handed over from the afternoon shift were prescribed correctly.

60. As I have noted above, the ED was busy at the time of Mrs A's admission. RN E told HDC that in addition to her patients and nursing duties, often nursing staff are responsible for administration and cleaning duties. As shift leader, she was also responsible for completing acute admission paperwork, trolley checks, filing work, cleaning and replacing equipment, and attending call bells.

61. In these circumstances, while I have concerns about RN E's monitoring of Mrs A, I consider that her workload on the shift contributed to her ability to complete the necessary observations and documentation. I take this opportunity to remind RN E of the importance of clear and accurate clinical documentation.

WDHS — breach

62. As I have set out above, multiple staff were involved with Mrs A's care during her admission, and it is accepted that staff were unfamiliar with the 3% saline solution.

63. WDHS has accepted that there was a high workload for staff at the time Mrs A was admitted to Ōamaru Hospital and has acknowledged the pressures on staff at the time due to high patient numbers in a small rural ED. Dr Peters advised that appropriate guidelines were in place at the time to guide staff. However, Dr Peters considered that shift patient numbers and complexity volumes at the time were at the limit of what would be expected in an ED, not taking into consideration any further issues arising on the ward or the maternity unit. CNM Manning also acknowledged the impact of staffing levels on the ability of RN D in his supervision of Ms F and has referred to the position statement [29] on nursing staff requirements in EDs, which highlights that inadequate staffing levels contribute to adverse patient outcomes, whereas adequate acuity-based workloads result in improved patient outcomes, reductions in adverse events, and staff resilience.

64. I accept this advice. Ensuring that staffing levels are adequate is essential in minimising potential harm to patients. While I acknowledge that individual staff were involved, I consider that the workload at the time meant that staff could not carry out their respective roles adequately. Ultimately, WDHS bears the responsibility of ensuring safe staffing levels, and I am critical that the ED did not have adequate staffing levels to manage high patient numbers and that this had an impact on the standard of care provided to Mrs A by multiple staff. Accordingly, I find that WDHS breached Right 4(4)[30] of the Code.

Changes made since events

65. WDHS told HDC that there are current pressures on the health system, and there are limited measures individual hospitals can take to address this broader issue. However, WDHS said that it has continued to recruit and employ further staff, including both nursing staff and doctors.

66. WDHS has commenced training of nursing staff on the infusion of IV fluids, including on the use of the appropriate settings on the Argus pump to ensure that the fluid transfused is limited to that which has been prescribed and the monitoring and administration of IV fluids. WDHS also advised that it is in the process of replacing all old Argus pumps with Argila standard pumps, which have dose error reduction systems.

67. WDHS requires its nursing staff to complete online competency modules on a minimum three-yearly basis, which relevantly include the topics of 'Medication and Fluid Foundation'

[29] CENNZ-NZNO Position Statement — Registered Nursing Staff Requirements in Emergency Departments.
[30] Right 4(4) of the Code states that every consumer has the right to have services provided in a manner that minimises the potential harm to, and optimises the quality of life of, that consumer.

(ED) and 'IV Therapy Medication Administration'. Ongoing EWS training is continuing for nursing staff. EWS auditing is set to be implemented in ED via an electronic system, with a paper-based system having commenced in January 2025.

68. WDHS medical staff conducted a peer review meeting, during which the Clinical Director discussed the prescribing and administration of 3% saline, including how uncommon the use of that IV fluid is, and what to be aware of. During this meeting, clinical staff agreed that the management of patients with sodium levels of <115mmol/L should be discussed with clinical staff at Dunedin Public Hospital.

69. As outlined above, WDHS had policies/guidelines regarding IV fluid infusions available at the time of Mrs A's admission. However, steps have been taken to make the relevant information more readily accessible. In this regard, WDHS has obtained from Dunedin Public Hospital pharmacy a two-page document entitled 'Sodium Chloride 3% (Hypertonic)', which is from the NoIDs. A copy has been uploaded to the internal SharePoint site, and a hard copy of the document is available in the resuscitation room. Staff have also been reminded about the availability of 'UpToDate' and how to use this.

70. RN D told HDC that he has made the following changes:

a) He has reviewed his nursing practice around IV medication practice and protocols, including reviewing resources on hypertonic and isotonic solutions, and he is more vigilant about checking the prescription/medication chart and checks directly with the doctor if unsure.

b) He has improved his communication with CAP students to avoid any miscommunication.

71. RN D also advised that there has since been an increase in staff at Ōamaru Hospital, which has allowed for an additional RN/paramedic to be rostered on in the afternoon shift, and patients can now be assigned a primary nurse/paramedic.

72. Dr C told HDC that he has since reflected on his actions and taken steps to ensure that this error does not happen again, including undertaking peer mentoring and clinical audits and reviewing publications and guidelines relating to hyponatraemia.

Recommendations

WDHS

73. I recommend that WDHS provide a written apology to Mrs A's family for the deficiencies identified in this report. The apology is to be sent to HDC, for forwarding to Mrs A's family, within three weeks of the date of this report.

Health NZ Southern

74. I recommend that Health NZ Southern:

a) Provide training for staff in emergency departments and rural hospitals on the management of hyponatraemia with reference to this case. Evidence confirming the

content and delivery of the presentation, and to whom it has been presented and when, is to be provided to HDC within six months of the date of this report.

b) Provide an update to HDC on clinical staff recruitment to established FTE[31] at Ōamaru Hospital, within three months of the date of this report.

c) Provide an update on the guidance on volume/administration of 3% sodium chloride solution that is not currently covered by NoIDs, within three months of the date of this report.

d) Provide confirmation that 3% saline is kept in a separate location from other 1000ml bags of intravenous fluids and labelled as a high alert or complex medication, within three months of the date of this report.

e) Provide EWS audit results over the next six months to ensure that this documentation is improving. Health NZ is to report the results of the audit to HDC. Where the audit results do not show 100% compliance, Health NZ is to advise what further steps will be taken to address the issue and undertake a further audit to confirm compliance.

Dr C

75. I recommend that Dr C consider Dr Peter's recommendation to complete the University of Otago's rural health programme papers, specifically GENA729 Medical Specialties in Rural Settings.

RN D

76. I recommend that RN D:

a) Undertake training on the infusion of IV fluids. Confirmation of this is to be sent to HDC within three months of the date of this report.

Follow-up actions

77. A copy of the sections of this report that relate to Dr C will be sent to the Medical Council of New Zealand.

78. A copy of the sections of this report that relate to RN D will be sent to the Nursing Council of New Zealand.

79. A copy of this report with details identifying the parties removed, except Ōamaru Hospital, Health NZ Southern, and the independent advisors on this case, will be sent to Te Tāhū Hauora Health Quality & Safety Commission and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

[31] Full-Time Equivalent

Appendix A: Independent clinical advice to Commissioner

The following independent advice was obtained from Dr Johan Peters:

'4 August 2024

Complaint: Mrs [A].

HDC ref: C23HDC03316

NHI: […]

Independent advisor report.

My name is Dr Johan Peters. I hold the qualifications of MB, ChB, Otago 1983, DipObst, FRNZCGP, FDRHM, AFRACMA. I have been in active practice for the previous 41 years. I have rural hospital experience in Tairāwhiti, Queensland, and Rarotonga. I am currently an assessor for prior learning with the DRHM. I am currently employed in Gisborne Hospital, in the positions of SMO, director of clinical services, and interim chief medical officer.

I have received the documentation regarding Mrs [A]'s care as enclosed from the HDC. I have also used an online source, "UpToDate", a commonly used and available US-based subscription source for clinical information, specifically, the chapter title "Overview of the treatment of hyponatraemia in adults". I am able to print this chapter and will enclose it, though the site does not allow me to email an attachment.

Regarding Dr [C]'s care provided to Mrs [A] [across two consecutive days in] November 2023, I consider his care to be a severe departure from the accepted standard of care. Dr [C] states in his response that his understanding of the condition and its treatment is limited. While this in itself should be considered a moderate departure from acceptable standards, it is not acceptable to continue a treatment for a patient where, by his own statement, the condition and treatment are not fully understood. This escalates the departure from standards to severe. It is also apparent that over the remainder of the 10-hour overnight shift, there were further RN questions regarding the continuation of the prescribed treatment, and further opportunities for Dr [C] to either seek advice, or research the condition online. Despite this, Dr [C] also chose to repeat the infusion of 1000ml of hypertonic saline. It appears from the records that the error in over prescription of hypertonic saline was only noted by Dr [B]'s arrival to take over the next shift, the next morning.

While the clinical workload in the department at that time was a factor, it is also a factor that Dr [B]'s conservative prescription of one 100ml bolus was a clue to how this condition should be managed, and Dr [C]'s not taking the opportunity to review his decision, despite acknowledging his lack of understanding does not reflect positively on his decision making.

I have not consulted any peers regarding this decision making, as the HDC has made it clear that this is a confidential process.

HDC documentation has created a useful picture of the staffing and physical constraints of the department at the time the care was delivered. I have not been advised of what other clinical workload was expected of Dr [C], or what clinical volume was present in the department or ward on his overnight shift.

Regarding improving Dr [C]'s practice, I recommend he review the above mentioned entry in "UpToDate" regarding hyponatraemia. I also strongly recommend enrolment in one of the University of Otago's rural health programme's papers, specifically GENA729 Medical Specialties in Rural Settings.

Question 2:

Dr [B]'s treatment plan. I consider Dr [B]'s plan to show no departure from an accepted standard of care. Regarding Mrs [A]'s hyponatraemia, the important considerations are the severity of the hyponatraemia, the acuteness or chronicity, and the clinical context or reversibility of the condition, and the symptomatic nature of it. The prescription of a modest bolus of hypertonic saline, with adequate handover and instructions regarding review show safe practice. It is true that the manner of the prescription instructions are slightly unusual, but they are clear, and he could have expected the instructions to be followed. The treatment is consistent with the guide "Treatment of hyponatraemia" I have quoted above.

My only potential recommendation for improvement is regarding manner of prescription, "100ml over half hour" and then a stop date and time could have been more definitive. I am also not privy to what handover discussion happened between Dr [B] and Dr [C] but in a hospital heavily dependent on locum doctors, that are not accustomed to each other's skill or knowledge levels I would remind Dr [B] that it would have been useful to ensure that Dr [C] knew exactly what the plan was, and what the rationale behind that plan was, remembering also that Dr [C] is responsible for his own actions.

Question 3: Adequacy of policies at the time.

I have no other sources of information, other than that supplied to me by […] HDC. I consider these policies to be adequate for the purpose for which they were intended. Specifically, the Medication and Fluids Procedures Protocol, under appendix A, has a clear pathway for questioning IV fluid prescriptions, with the prescribing doctor. Dr [B]'s prescription of hypertonic saline was unusual, and it was appropriate that the two nurses involved chose to question this. It was not appropriate to change the prescription from 100ml to 1000ml of 3% saline, without confirming this with the medical officer, either Dr [B] or Dr [C], while accepting that Dr [C] was difficult to contact at the time, due to workload. A reasonable alternative action was to not start the infusion.

Regarding policies, I find no departure from standard of care.

Regarding nursing standard of care, I expect HDC to seek nursing expert opinion, but I would consider that the willingness of RN [Ms F] to change the fluid prescription from 100ml to 1000ml and the willingness of checking nurse RN [D], without medical confirmation by the prescriber, to attract a statement of departure from acceptable

standard of care. As a mitigating factor, my impression of the pressures in the department at the time, are that they must have been considerable to allow this decision to be made.

In summary:

1. Mrs [A] when she attended with her respiratory infection, giving consideration to her age and comorbidities, always had a guarded prognosis, and death would have been a significant risk from the outset.
2. The post mortem report shows that Mrs [A] did not have an immediately terminal complication from her too rapid correction of sodium, as she did not have either brain herniation or an osmotic demyelination syndrome.
3. It is reasonable to consider that the large fluid and electrolyte changes associated with the large dose of 3% saline administration will not have helped her outlook.
4. There were adequate protocols in place to allow the nursing staff to question the intravenous fluid prescription.
5. While HDC will await nursing advice, it is unusual practice for RNs to not question such a prescription and to proceed to alter the prescription anyway. This was an opportunity missed, while clinical workload at the time was a contributing factor.
6. Dr [B] prescribed what most clinicians would consider a reasonable treatment, with clear safeguards, but perhaps not taking into consideration the limitations of the doctor that was being handed over to.
7. Dr [C] demonstrated a lack of understanding of a clinical condition he should have at least had a sense of that it presented a significant risk. He was also given a clue by Dr [B]'s conservative prescription pattern and was willing to continue treatment despite his own admission of limited understanding of the condition or treatment, over the space of an entire shift. Please note my recommendations regarding further education for Dr [C].
8. I do not know what online sources of clinical information were used, but from personal experience, the online source "UpToDate" is useful, particularly when a rural clinician is faced with an unusual condition, and if Ōamaru Hospital does not currently have a subscription, I recommend that they get one.

Dr Johan Peters'

'I am Dr Johan Peters, and I provided the initial report on the care of Mrs [A]. I have received further documentation from the HDC, including a response from Dr C, regarding his subsequent actions and reflections, and from the management/nursing staff at Ōamaru Hospital with particular reference to workload levels, and availability of reference materials at the hospital. I have not been asked to comment on nursing care.

I would like to begin my response by again expressing my sympathy for the whānau of Mrs [A].

Regarding the Ōamaru Hospital response, my comments are:

1. There are adequate resources available for doctors to access to assist them in the management of conditions which they don't usually see, this response is satisfactory.
2. Regarding shift patient numbers and complexity volumes, this is at the limit of what would be expected to be seen in an emergency department, not taking into consideration any further issues arising on the ward or the maternity unit. In particular, transfer patients and procedural sedation patients absorb significant time. Also, triage 3 patients tend to be a mixed group of patients, from the simple to the severely ill, needing substantial workup. The context is of a doctor working at the limits of what is safe.
3. Despite the above, the requirement remains for the doctor, in such an environment, to adequately prioritise, to make those that can wait, wait, and to be aware of red flags in patients that need further consideration. Severe hyponatraemia in a severely ill elderly respiratory patient is such a red flag.

Regarding Dr [C]'s response:

1. I am now more aware of the context, in terms of patient load and patient complexity that Dr [C] was operating under.
2. I accept the learning work that Dr [C] has done, this has been specific to this case, and also the clinical case/audit presentations which are all useful and this is an acceptable learning response to this incident and investigation.
3. Some of Dr [C]'s response continues to suggest that prescribing issues should have been raised by the nursing staff, and that more resources/protocols should have been in place. While this may well have provided a secondary safeguard, the responsibility for his prescribing and understanding his patient's condition, ultimately rests with himself.

My original decision that Dr [C]'s treatment represented a departure from the expected standard of care remains. There are however, two further issues to consider, and they are:

1. The context of the overall workload in the department.

2. The extent to which the outcome of the patient's care should influence a decision regarding the severity of the deviation. By this I mean that sometimes in clinical care, there can be a major deviation from the standard, with little effect on the patient, and sometimes a minor deviation can have catastrophic results. In this case, there could have been catastrophic results, but the post mortem findings demonstrate that the deviation of care, in terms of the hyponatraemia management, did not cause Mrs [A]'s death. If Mrs [A] had not died from respiratory failure, it is likely that the hyponatraemia issue would have been dealt with by the ED's usual audit/clinical review processes only.

In view of the context of the ED workload, and the issues described above, I would like to alter my assessment of Dr [C]'s care to that of a moderate departure from the standard of care.

Thank you for allowing me to assist and review in this case,

Dr Johan Peters'

Appendix B: Independent clinical advice to Commissioner

'Complaint:	**Mrs [A]**
Our ref:	**C23HDC03316**
Independent advisor:	**CNM Therese Manning**

I have been asked to provide clinical advice to HDC on case number **C23HDC03316**. 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 expertise involved:	I have been a Registered Nurse since December 1997. I have a Bachelor of Health Science in Nursing, and a Post graduate Diploma in Health Science in Advanced Nursing. I have completed TNCC (Trauma Nursing Core Course), Advanced Paediatric Life Support, the NZ Triage Course, and the National Burns Course. I was employed at Middlemore Emergency Department from 2002 until 2006 as a registered nurse where I completed the Emergency Care Modular Programme, and I was then employed as a Clinical Charge Nurse in Middlemore Emergency Department from 2006 until 2018. Since May 2018 I have been working as a Clinical Nurse Manager at Taranaki Base Hospital Emergency Department. This is a management role but also involves supporting the Emergency Department clinically where required, including providing Resus support, assisting at Triage when there are high patient presentations, and coordination of the Emergency Department. I have been asked to comment on the care provided by RN [D], and CAP nurse student Ms [F], to Mrs [A] [across two consecutive days in] November 2023.
Documents provided by HDC:	1. Letter of referral dated 29 November 2023 2. Waitaki District Health Services response dated 8 March 2024 3. Clinical records from Ōamaru Hospital covering the period [across two consecutive days in] November 2023 4. Statement from Dr [B] 5. Report from Dr [B] 6. Statement from Dr [C] 7. Statement from [ED Team Leader] 8. Statement from RN [D] 9. Statements from CAP nursing student, Ms [F] 10. Statement from RN [E]

	11. Statement from paramedic […] 12. Statement from RN [G] 13. Relevant policies and guidelines and meeting minutes 14. Post-mortem report
Referral instructions from HDC:	RN [D]/Ms [F] 1. The standard of care provided by RN [D] to Mrs [A] [across two consecutive days in] November 2023 with particular reference to the administration of saline; 2. The standard of care provided by CAP nursing student, Ms [F] to Mrs [A] [across two consecutive days in] November 2023; 3. Whether Ms [F] had adequate supervision at the time of these events; 4. Any other comments you wish to make on the care provided to Mrs [A].

Factual summary of clinical care provided complaint:

Brief summary of clinical events:	Mrs [A] was referred to come into hospital on […] November 2023 due to a low sodium level. She had also been unwell with a chesty cough for three days. Upon admission to Ōamaru Emergency Department (ED) a repeat blood test confirmed the low sodium level, and a chest x-ray indicated that she was suffering from pneumonia. Mrs [A] was prescribed 100ml of hypertonic saline by Dr [B] to treat her low sodium level, to be administered at a rate of 200ml/hr. 1000ml 3% saline was incorrectly administered to Mrs [A]. An additional 1000ml of 3% saline was later prescribed that evening, by another doctor to be administered overnight. Mrs [A] passed away on the morning […], and shortly before her death it was found that she had been administered a total of 1800ml instead of the 100ml initially prescribed. The coroner has referred this matter to the HDC for further investigation into the treatment and care of Mrs [A], and the significant high saline doses prescribed and administered. Ōamaru Hospital have responded that the Emergency Department (ED) was busier than usual on this shift, with limited staffing levels for the number of patients in the ED. RN [D] initially triaged Mrs [A], and CAP nurse Ms [F] then took over her care. Ms [F] and RN [D] discussed the IV fluids prescribed by Dr [B]; both were unfamiliar with the prescription and administration of 3%

	saline. There are differing versions of the conversation that took place between RN [D] and Ms [F] —RN [D] recalls Ms [F] advising him the fluid chart should have read 1000ml, rather than 100ml; Ms [F]'s recollection of the conversation was that she asked RN [D] for clarification on the amount of 3% saline that should have been prescribed. RN [D] believed Ms [F] had received confirmation that the amount of 3% saline that should have been prescribed was 1000ml. Ms [F] believed that RN [D] had received clarification of this prior to starting the intravenous infusion of the 1000ml bag of 3% saline. They both attempted to obtain confirmation from Dr [C], who had come on to work the night shift, but as he was busy, RN [D] made the decision to start administration of the 3% saline and said he expected the chart to be amended once the doctor was free. The night shift doctor — Dr [C], recalls being told by the nurses on night shift a few hours later that the fluid that Dr [B] had prescribed had been completed, and that Mrs [A]'s current sodium level was now 119, up from 112. He was unfamiliar with prescribing hypertonic solution for low sodium levels but made the decision to prescribe a further 3% saline 1000ml bag to run over 10hrs. This was started at 12.43am. The nursing documentation overnight conveys that Mrs [A] was stable, but she had "crackly" breathing throughout the shift. At around 7am on the morning of […] November, the blood tests were repeated, and the nurses reported to Dr [C] that Mrs [A]'s sodium level had risen to 142, and her potassium level had dropped to 2.3. Dr [C] recognised that the sodium level had risen too rapidly and requested the 3% saline infusion to be stopped — this is documented as being discontinued at 7.43am. When Dr [B] started his shift at 8am he reviewed Mrs [A] and noticed that there were two 1 litre bags of 3% saline hanging at the bed — one empty and one almost empty. He determined from this that 1 litre of hypertonic saline may have been given instead of the 100ml he had prescribed. He attempted to correct the hypokalaemia and reverse the over-correction of her sodium level, by prescribing 1000ml 5% dextrose fluid with 40mmol of potassium added. Mrs [A]'s respiratory rate and heart rate rapidly increased at 8.40am and she was reviewed again by Dr [B]. The decision was made that aggressive treatment would not be appropriate; she was kept comfortable and passed away at 8.55am.

Question 1: The standard of care provided by RN [D] to Mrs [A] [across two consecutive days in] November 2023 with particular reference to the administration of saline	
List any sources of information reviewed other than the documents provided by HDC:	NZNO Guidelines for the Administration of Medications.
Advisor's opinion:	RN [D] had a heavy workload on this shift, overseeing the Emergency Department, triaging patients, providing care for patients in Resus, as well as supervising a CAP nurse. It appears that due to his workload he decided not to wait and speak to the doctor before starting the administration of 3% saline but relied on what the CAP nurse had advised him concerning the amount of fluid to be administered. He administered a different amount of fluid than what had been prescribed on the fluid chart to be given. He should have obtained confirmation and documentation of the correct amount of fluid to be administered prior to starting the infusion. I have reviewed RN [D]'s second statement and can see that he recognises the gravity of this decision. He now recognises the importance of checking and verifying that the prescription is correct prior to administration of medication. He has stated that going forward he would do this irrespective of whether the ED was busy and understaffed at the time.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	Accepted practice is that medication including intravenous fluids should be administered as prescribed — if there is concern that the prescription is incorrect, it is the standard of care to clarify the correct dose prior to administration of medication. The CAP course provider dictates whether CAP nurses can administer intravenous medication and fluids; this depends on their pre-learning module. The CAP guidelines for Ōamaru Hospital are that CAP nurses can administer intravenous fluids under direct supervision.
Was there a departure from the standard of care or accepted practice? • No departure;	I believe this was a moderate departure from standard of care. RN [D] was unfamiliar with this medication and was guided by the CAP nurse who he believed was experienced, and that she had received confirmation of the amount of fluid to be administered from Dr [B].

• Mild departure; • Moderate departure; or • Severe departure.	This was likely also influenced by the 3% saline stored in a 1000ml bag for infusion, rather than a smaller bag such as 100ml. He recognised at the time that he needed a doctor to change the prescription but did not take the time to ensure this was done and did not ensure the prescription was correct prior to administration of the fluid. The fluid was not administered as it was prescribed, which is one of the basic five rights of medication administration — the right medicine in the right dose must be administered to the right person at the right time by the right route. Cap students are also not regulated under New Zealand law; therefore, it is the nurse or midwife who is accountable for the actions of the student.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	I have discussed this case confidentially with a colleague who is a nurse educator, working with nursing students. She agrees that the fluid should have been administered as prescribed, and if there was concern that the prescribing was incorrect, then this needed to be clarified before commencing the fluids. She has also noted that CAP nurses are students until the New Zealand Nursing Council issues them with an Annual Practising Certificate. They must be actively supervised when starting any intravenous fluids.
Please outline any factors that may limit your assessment of the events.	There is a differing version of events between what RN [D] recalls and CAP nurse Ms [F] states took place — she states that she was unsure if the amount was correct and says she asked the RN for clarification, whereas RN [D] recalls Ms [F] advising that the chart should have read 1000ml and suggesting the chart should be changed, with RN [D] incorrectly presuming she knew this from talking to Dr [B], and the 100ml was a prescribing error. This conversation influenced the following decision to administer the wrong amount of fluid, but as it is not documented it cannot be taken into full account when reviewing this case.
Recommendations for improvement that may help to prevent a similar occurrence in future.	I would recommend that a CAP nurse is not approved to be the second "checker" of intravenous fluids and medications, but that a registered nurse (RN), or enrolled nurse (EN) be the second checker. If no RN/EN is available, then intravenous fluids and

	medication can also be checked by a doctor as the second checker.
Question 2: The standard of care provided by CAP nursing student Ms [F] to Mrs [A] across two consecutive days in November 2023	
List any sources of information reviewed other than the documents provided by HDC:	NZNO Guidelines for the Administration of Medications.
Advisor's opinion:	Overall Ms [F] provided thorough nursing care to Mrs [A], including initial vital signs, electrocardiogram (ECG) of her heart, inserting an indwelling catheter under supervision, and escalating concerns about her high blood pressure and repeat sodium results.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	CAP nursing guidelines for Ōamaru Hospital clearly document that all fluids and medications must be prepared and administered under the direct supervision of a registered nurse. The New Zealand Nurses Organisation guidelines for Nurses on the Administration of Medicines recognises that to achieve the outcomes and standards required for registration, students must be given opportunities to participate in the administration of medicines but confirms that this must be done under direct supervision.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	I believe there was a mild departure from accepted practice, in the responsibility that Ms [F] took on for the care of Mrs [A], in overseeing the ongoing administration of the incorrect amount of 3% saline, when the prescription had not been confirmed as being incorrect and changed. As she was under the supervision of a registered nurse this should have been the registered nurse's overall responsibility to ensure the fluid prescription was correct prior to commencing the 3% saline.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	I have discussed this case with a senior nursing colleague who is a nurse educator; her view is that the CAP nurse should have had direct supervision while providing care for this patient, and that it was the registered nurse's responsibility to ensure the 3% saline was administered correctly.

Please outline any factors that may limit your assessment of the events.	The factors limiting my assessment of events are the discrepancy in what RN [D] and CAP nurse Ms [F] recall of the conversation regarding the prescription of the correct amount of fluid. However, it was the RN's responsibility to ensure the prescription was correct.
Recommendations for improvement that may help to prevent a similar occurrence in future.	I would again recommend that a CAP nurse is not the "second checker", but medication and fluids is double checked by another registered nurse. I would also recommend that CAP nurses have closer supervision while on placement in the Emergency Department, rather than taking on a patient load with minimal supervision of their care.
Question 3: Whether Ms [F] had adequate supervision at the time of these events	
List any sources of information reviewed other than the documents provided by HDC:	NZNO Guidelines for the Administration of Medications. CENNZ-NZNO Position Statement — Registered Nursing Staff Requirements in Emergency Departments
Advisor's opinion:	According to the CAP nursing guidelines for the hospital, all intravenous medication administration must be under the direct supervision of a registered nurse, who must be physically present. The fluid was started by the registered nurse, but it does not appear that Ms [F] was under active supervision of an RN when she spoke to Dr [B] and received the prescription for the intravenous 3% saline, which impacted on the misconception that the amount of fluid was meant to be a different amount from what Dr [B] had prescribed.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	Hospital guidelines at the time of the events documents that a CAP nurse should be under the direct supervision of a registered nurse, who should be physically present, observing each step of the procedure.
Was there a departure from the standard of care or accepted practice? • No departure;	I believe there was a moderate departure from accepted practice — due to the staffing model at this time Ms [F] was not directly supervised by the one Registered nurse on duty, as they were also focusing

• Mild departure; • Moderate departure; or • Severe departure.	on Triage, Resus, and overseeing the care of other unwell patients in the department.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	I have consulted with a senior nurse in the Emergency Department where I work, who coordinates and has been a preceptor to CAP nurses. Her view is that even with many years of overseas experience, CAP nurses are still students and are not familiar with the different medications and processes in hospitals in New Zealand. Due to this, the registered nurse should not have taken the advice of the CAP nurse into account with regards to the prescription of medication.
Please outline any factors that may limit your assessment of the events.	I am not familiar with the staffing model in a small hospital which includes paramedics in the staffing numbers, and if their scope of practice would include overseeing a CAP nurse at Ōamaru Hospital.
Recommendations for improvement that may help to prevent a similar occurrence in future.	I recommend that a minimum of two emergency trained registered nurses are rostered to work in the Ōamaru Emergency Department on every shift, not only to ensure adequate supervision of students and CAP nurses, but also for patient safety in terms of being able to double-check fluids and medication, assist in a potential resuscitation of an unstable patient, and assist with the workload with an improved nurse–patient ratio for safer patient care. The College of Emergency Nurses New Zealand (CENNZ) — NZNO guidelines note that inadequate emergency nurse staffing levels contribute to adverse patient outcomes, whereas adequate acuity-based workloads result in improved patient outcomes, reductions in adverse events, and staff resilience.
Question 4: Any other comments you wish to make on the care provided to Mrs [A]	
List any sources of information reviewed other than the documents provided by HDC:	HQSC New Zealand Early Warning Score Vital Sign Chart User Guide 2017
Advisor's opinion:	It is apparent that the nursing staff across both the afternoon and night shift, as well as the doctor on the night shift, were unfamiliar with the prescribing and administration of 3% saline. The nurses providing care to Mrs [A] overnight did not realise there was an error

	in the administration despite the documented prescription of 100ml 3% saline being unchanged, with the remaining part of the first 1000ml 3% saline infusion being administered during their shift. This was possibly not flagged as an error due to the doctor overnight prescribing a 1000ml bag of 3% saline, and the presumption by the night shift nurses therefore that this was standard practice. A respiratory rate was not documented as part of Mrs [A]'s vital signs after 9.15pm, and an "Early warning score" (EWS) was not documented as being calculated overnight until 8.40am, shortly before she passed away. The national vital signs chart and New Zealand early warning score (NZEWS) is calculated from routine vital sign measurements — the score increases as vital signs become increasingly abnormal. It provides a safety net for adult patients who acutely deteriorate while in hospital — a high score triggers an escalating clinical response so that clinicians with the right skills can intervene and manage the patient's deterioration. Potentially Mrs [A]'s deterioration would have been alerted to earlier if her respiratory rate had been assessed and documented and an accurate EWS score had been calculated.
What was the standard of care/accepted practice at the time of events? Please refer to relevant standards/material.	The national vital signs chart and NZ early warning score (EWS) is accepted as the standard of care to document vital signs and is part of a mandatory escalation pathway in hospitals across New Zealand. The Injectables book states that 3% saline should not be given too rapidly, but does not specify what amount should be given, and does state it can be administered undiluted.
Was there a departure from the standard of care or accepted practice? • No departure; • Mild departure; • Moderate departure; or • Severe departure.	I believe there was a moderate departure in standard of care in the lack of vital signs overnight, in respect to the respiratory rate not being assessed and therefore no EWS score to alert nursing and medical staff that Mrs [A] was potentially deteriorating overnight. There was a mild departure in standard of care in not checking that the fluids handed over from the

	afternoon shift to night shift that were in progress were correctly prescribed.
How would the care provided be viewed by your peers? Please reference the views of any peers who were consulted.	I have discussed this case confidentially with a senior nurse in the Emergency Department where I work, who has agreed that deterioration due to both the pneumonia, and symptoms of a rapid increase in sodium levels may have been alerted to sooner if Mrs [A]'s respiratory rate had been documented and an EWS score calculated. The ED nurse educator who I consulted with has suggested that 3% saline be kept in a separate location from other 1000ml bags of intravenous fluids such as 0.9% saline which are commonly given as an entire 1000ml dose, especially given that 3% saline is likely to be administered infrequently in a small Emergency Department.
Please outline any factors that may limit your assessment of the events.	WDHS has commenced training of nursing staff on the infusion of IV fluids, including on use of the appropriate settings on the Argus pump to ensure that the fluid transfused is limited to that which has been prescribed. I have not used the Argus pump in my roles as a registered nurse so it is not clear how this would prevent such an administration error occurring again in the future if the prescribed amount had still been entered incorrectly.
Recommendations for improvement that may help to prevent a similar occurrence in future.	I would suggest there is education to the nursing staff around the importance of a full set of vital signs being obtained to obtain an accurate EWS to ascertain any deterioration in a patient's condition, and that EWS are audited over the next six months to ensure this documentation is improving. I would recommend that 3% saline be stored in a separate location from other intravenous fluids and labelled as a high alert or complex medication. I would also advise that staff are made aware of and can contact the on-call pharmacist after hours, if unsure of a medication dose and administration.
Name: Therese Manning Date of Advice: 18 November 2024	