Hutt Valley District Health Board

A Report by the
Health and Disability Commissioner

(Case 16HDC00823)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. Mr A, aged in his seventies at the time of events in 2015, had motor neurone disease[1] and required a bi-level ventilator machine (a BiPAP[2] machine) 24 hours a day to assist with his breathing. He was admitted to the Emergency Department (ED) at the public hospital with respiratory difficulties, and transferred to a ward to be observed overnight and treated with intravenous antibiotics.

2. Mr A's observations were taken at 7pm, and an early warning score (EWS[3]) of 3 was calculated. At 7.40pm, Mrs A gave Mr A his regular sedative and attached the mask from his BiPAP machine.

3. At 10.45pm, repeat observations were undertaken and an EWS of 0 was calculated. At 11.45pm, Mr A called for assistance with toileting. A registered nurse assisted him and checked his face mask. At 12.10am, repeat observations were undertaken. Mr A's oxygen saturation level was 93% and his EWS was calculated at 3.

4. At 1am, the registered nurse handed over Mr A's care to another registered nurse. The notes record that Mr A was settled with his BiPAP in situ. Mr A could not be seen from the nurses station, and the curtains were pulled around each cubicle.

5. At 4am, a registered nurse opened the curtain and found Mr A to be unresponsive, with his ventilation mask removed. He could not be revived.

Findings

6. Mr A was not monitored adequately.

7. The EWS Chart did not reflect the EWS Policy accurately, particularly in respect of the frequency of observations. It was also not clear how the EWS was to be calculated.

8. There was no policy for monitoring personal BiPAP machines. In the absence of a policy, the BiPAP machine should have been monitored hourly, but it was not.

9. Hourly observations should have been undertaken. EWS scores of 3 were recorded at 7pm and 12.10am and, on each occasion, the score should have triggered hourly observations. An EWS score at 10.45pm should have been calculated at 3, which should also have triggered hourly observations.

[1] Describes a group of diseases that affect the nerves in the brain and spinal cord and result in the wasting of muscle.
[2] Bi-level positive airway pressure.
[3] A tool used to assist staff with the recognition and appropriate response to a patient who is deteriorating clinically, or is at risk of clinical deterioration. An EWS is calculated from routine vital sign measurements, including respiration rate, presence/absence of oxygen therapy, oxygen saturation, heart rate, blood pressure, level of consciousness, and temperature. If any parameter deviates from normal, a score (0–3) is assigned. The score from each individual parameter is added together to calculate the EWS. The score assigned increases as the vital signs deviate further from normal.

10. An oxygen saturation level of 93%, recorded at 12.10am, should have triggered a review by a house officer, but it did not.

11. It is the responsibility of Hutt Valley DHB to have in place adequate systems to ensure that an acceptable standard of care is provided to consumers. This includes having appropriate policies, having working documents that accurately reflect those policies, and ensuring that the policies are complied with. Hutt Valley DHB failed to provide services with reasonable skill and care and, accordingly, breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights.[4]

Recommendations

12. The Commissioner recommended that Hutt Valley DHB amend its EWS Policy and EWS Chart to clarify (a) how an EWS is calculated when a patient has a domestic BiPAP; (b) the frequency of observations for each EWS; and (c) who is to be contacted when the EWS Escalation Protocol requires escalation, and how to contact that person.

13. The Commissioner also recommended that Hutt Valley DHB develop a policy for the management of patients who are using a domestic BiPAP machine, and provide evidence of staff training on its EWS and BiPAP machines.

14. In addition, the Commissioner recommended that Hutt Valley DHB provide an apology to Mrs A for its breach of the Code.

Complaint and investigation

15. The Health and Disability Commissioner (HDC) received a complaint from Mrs A about the services provided by Hutt Valley District Health Board to her husband, Mr A. The following issue was identified for investigation:

- *Whether Hutt Valley District Health Board provided Mr A with an appropriate standard of care in 2015.*

16. The parties directly involved in the investigation were:

Mrs A	Complainant, Mr A's wife
Hutt Valley District Health Board	Provider
Also mentioned in this report:	
RN B	Registered nurse
RN C	Registered nurse

[4] Right 4(1) states: "Every consumer has the right to have services provided with reasonable care and skill."

17. Further information was received from:

Ambulance service
Another District Health Board
Coroner

18. Independent expert advice was obtained from a registered nurse, Karla Martin (Appendix A), and a general physician, Dr Richard Shepherd (Appendix B).

Information gathered during investigation

Background

19. Mr A, in his seventies at the time of events, had motor neurone disease (MND) and required a bi-level ventilator machine (a BiPAP machine) 24 hours a day to assist with his breathing.

Transfer to the public hospital

20. At 11.34am on Day 1, Mr A was admitted to the Emergency Department (ED) at the public hospital by ambulance after having been unwell for four days. He had a fever and lethargy, and was struggling to cough effectively. Mr A's wife, Mrs A, attended with him, and he had his personal BiPAP machine with him.

21. At 2.23pm, Mr A was examined in the ED and underwent a chest X-ray, an ECG, and a blood test. An ED house officer documented that Mr A's observations included a respiratory rate of 20 breaths per minute and an oxygen saturation level of 96%. A diagnosis of a "likely LRTI[5]" was made.

22. The house officer recorded that Mr A was to be admitted to a ward to be observed overnight and treated with intravenous antibiotics. The ED registrar agreed with this treatment plan.

23. Mr A was admitted to the ward between 6.34pm and 7pm. At 7pm, a registered nurse (RN) took Mr A's vital signs, which included a respiratory rate of 20 breaths per minute and an oxygen saturation level of 94%, and recorded that he had a supplementary source of oxygen (his BiPAP machine). She calculated an EWS of 3.

24. Mr A was assessed with a score of 14 using the Modified Braden Pressure Risk Assessment.[6] This meant that Mr A was at a moderate risk of developing a pressure sore. The assessment recorded that Mr A was "chairfast"[7] and had very limited mobility.

[5] Lower respiratory tract infection.
[6] A tool used to assess a patient's risk of developing a pressure ulcer or sore.
[7] Unable to leave his chair.

25. At approximately 7.40pm, the RN gave Mr A paracetamol. Mrs A gave him his regular sedative and attached the respiratory mask from his personal BiPAP machine. Mrs A then left the hospital.

26. At 10.45pm, Mr A's vital signs included a respiratory rate of 20 breaths per minute and an oxygen saturation level of 95%. It was noted that a supplementary source of oxygen was being used. Based on the EWS Chart, the oxygen saturation level of 95% had a score of 1, and the supplementary source of oxygen had a score of 2. However, the RN calculated that Mr A had an EWS of 0.

27. At 11.45pm, Mr A rang his call bell, and RN B attended. Mr A required assistance, as he had been incontinent and required a bottle to pass urine. RN B stated:

> "I confirmed that the machine was working by placing my hand against the face mask, so I could feel the air flow through it before I put the mask on [Mr A's] face."

28. RN C told HDC that she commenced her ward round at 12am and introduced herself to Mr A. She said that Mr A could not be seen from the nurses' station, and that the curtains were pulled around each cubicle.

29. At 12.10am, RN C recorded Mr A's vital signs on the vital signs chart. Mr A's oxygen saturation level was 93%, his respiratory rate was 20 breaths per minute, and his EWS was calculated as 3. This information was also recorded in Mr A's progress notes at 12.45am.

30. At 1am, RN C documented in the nursing notes that Mr A was "settled in bed with BiPAP insitu now sleeping". RN C stated that Mr A's next observations were due at 4am. RN C told HDC that at 1am, RN B provided a verbal handover of Mr A, stating that he was settled and asleep, his BiPAP machine was in situ, the call bell was within reach, and both sides were up on his cot. RN C stated that between 1am and 4am, Mr A did not use his call bell.

31. The Clinical Nurse Manager told HDC:

> "It would be fair to say the [ward] staff were not experts in management of MND or BiPAP if they were they may well have identified the potential risks at the least located him nearer to the nurses station and kept the curtains open so he could be observed more closely overnight."

32. At 4am, RN C opened the curtain around Mr A's bed and found Mr A to be unresponsive, with his ventilation mask removed. The nursing notes state:

> "Check [patient] to do vitals found [patient] half out of end of bed looked like trying to get out unresponsive. BiPAP not insitu but lying beside [patient]."

33. The emergency call bell was activated, but Mr A could not be revived. The ventilation machine data provided to HDC shows that the oxygen supply probably stopped around 2.20am.

Early Warning Score (EWS) and Escalation Protocol (EWS Policy)

34. The EWS Policy is a "track and trigger" system designed to identify an acutely ill adult at risk of deteriorating. Staff are expected to follow an escalation protocol dependent on the score. Escalation may range from a review of the frequency of monitoring vital signs, to making an emergency call.

35. The EWS Policy states:

- An EWS of 1–2 requires a review of both the care plan and the frequency of observations.
- An EWS of 3 must be communicated to the nurse in charge of the shift and to the Clinical Nurse Specialist — Critical Care Outreach. The care plan should be reviewed and the patient reassessed in one hour including the charting of the patient's urine output.

36. The EWS Policy indicates that a respiratory rate of 20–29 should be given a value of 2. There is no reference to the value to be given to a patient who is receiving supplementary oxygen. However, in the EWS Adult Vital Signs Chart (EWS Chart),[8] discussed below, a value of 2 is to be given to a patient who is receiving supplementary oxygen.

37. The appendix to the EWS Policy includes an EWS Escalation Protocol that outlines the "times of operation" and includes the contact numbers for the Critical Care Outreach Nurse, After Hours Manager, and Shift Coordinator during certain hours. It is unclear from the EWS Policy who is to be contacted outside these hours.

EWS Chart

38. The EWS Chart is the working document for staff to give effect to the EWS Policy. Staff are required to document the vital signs on the EWS Chart and calculate the EWS. The Chart states: "EWS 1–5 or any vital signs on the yellow zone [staff are required to] [m]anage pain, fever or distress [and] increase frequency of vital sign monitoring." Vital signs in the yellow zone include oxygen saturation levels of 94% and 95%.

39. The EWS Chart states that supplementary oxygen modes automatically count as 2 points towards an EWS score, regardless of the respiratory rate.

40. The EWS Chart also provides that an oxygen saturation level of 93% is a vital sign in the orange zone that requires review by a house officer within 20 minutes, escalation to a nurse in charge, and an increase in the frequency of vital signs.

Further information from Hutt Valley DHB

41. Hutt Valley DHB stated that when Mr A was admitted to the ward there was no medical reason for him to be cared for in a High Dependence Unit (HDU) environment.

[8] See Appendix C.

42. Hutt Valley DHB said that hospital BiPAP machines are used only within the HDU and Intensive Care Unit (ICU). There are prescriptive policies for the use of the machines in these units.

43. Hutt Valley DHB stated that when an inpatient is commenced on a hospital BiPAP machine, the Non Invasive Ventilation (NIV) policy applies. The NIV policy indicates that the BiPAP machine should be monitored (BiPAP machine settings, mask fit, and patient's level of alertness) and the results recorded hourly or as clinically indicated. In addition, the patient's vital signs (blood pressure, respiration, temperature, pulse, and oxygen saturation levels) should be recorded hourly when unstable, and four-hourly once stable.

44. Hutt Valley DHB said that Mr A was admitted to the ward with his own domestic ventilation machine. This was a machine that he had managed at home, and the settings did not need to be altered. Hutt Valley DHB said that for these reasons, the NIV policy did not apply to Mr A, and that routine observations had to be undertaken only every four hours.

45. Hutt Valley DHB told HDC that it did not have a policy for the use of personal or domestic ventilation machines when being used by a patient in hospital.

46. The Associate Director of Nursing told HDC:

> "Frequency of observations were not explicit in the admitting doctors plan for [Mr A]. Observations were completed within 1 hour of admission to the unit and there after 4 hourly until [Mr A] was found deceased."

47. Hutt Valley DHB told HDC that following these events the NIV Policy was reviewed, and that a further review was to be completed by the end of April 2019.

48. Hutt Valley DHB told HDC that RN C had completed BiPAP training.

49. Hutt Valley DHB stated:

> "[RN C] should have escalated the Early Warning Score (EWS) at [12.10am]. According to the EWS Escalation Pathway, [Mr A] should have received an increase in the frequency of vital sign monitoring and a House Officer review within 20 minutes. This does not appear to have occurred."

50. Hutt Valley DHB acknowledged that Mr A was at a moderate risk of developing pressure sores as per the Modified Braden Pressure Risk Assessment, but stated:

> "[T]his does not require any additional nursing cares to be put in place at the time of the assessment, therefore, a static mattress, nor two to three hourly turns were not part of [Mr A's] care plan."

Responses to provisional opinion

Mrs A

51. Mrs A was given an opportunity to comment on the "information gathered" section of the provisional opinion. She advised that she did not have any further comment to make.

Hutt Valley DHB

52. Hutt Valley DHB was given an opportunity to comment on the provisional opinion. It advised HDC that it had no further comment.

Opinion: Hutt Valley District Health Board

Care provided by medical staff at ED and on the ward — no breach

53. Mr A presented at ED with a fever and a cough. He had MND and brought his personal BiPAP machine with him. He was assessed by a registrar, who arranged blood tests, an ECG, and a chest X-ray. A diagnosis of "likely LRTI" was made. Mr A was then transferred to a ward for observation overnight.

54. Independent advice was obtained from Dr Richard Shepherd, a general physician. He advised:

> "In my opinion the assessment, investigation, management and documentation of the … interactions by the involved medical staff would meet the expected standard of care."

55. I am satisfied that Mr A received the appropriate care from the medical staff in ED and on the ward.

Monitoring BiPAP — breach

56. Hutt Valley DHB did not have a policy to guide staff when a patient was admitted with a personal BiPAP machine. However, Hutt Valley DHB did have a policy for the operation of hospital BiPAP machines in HDU and ICU.

57. My expert advisor, RN Karla Martin, advised: "I would expect [Mr A] to have received the same care as someone on hospital [BiPAP] ventilation [which is] hourly checks."

58. RN Martin added:

> "Based on [Mr A's] noted risk assessments, known history and presumed diagnosis, I consider he received suboptimal care. In my opinion he should have received … hourly checks to ensure the [BiPAP] ventilator was working as intended. I am concerned that this level of care was not provided to him. My fellow colleagues and I would see this as a major departure from accepted standards of care."

59. I am concerned that there was no policy in place to guide staff when a patient was admitted with a personal BiPAP machine. I am also concerned that Mr A's use of the BiPAP machine was not monitored to ensure that it was operating properly, as it would have been had the BiPAP machine been a hospital machine. I note that the curtains around Mr A's bed were drawn, and that staff could not see from the nurses' station whether the mask was secured or the machine was operating. This is particularly worrying given that Mr A had limited mobility and relied on his BiPAP machine. I accept RN Martin's advice that in this situation, hourly monitoring of the BiPAP machine was required, and I am critical that Hutt Valley DHB did not monitor Mr A's BiPAP machine more closely.

EWS Policy and EWS Chart — breach

60. The EWS Policy states that when a score of 3 is calculated, the care of a patient must be escalated to the nurse in charge of the shift, and that the patient must be reassessed within one hour. However, the EWS Chart, which gives effect to the EWS Policy, does not identify a timeframe for reassessments, and states only that with a score of 3, the frequency of the observations must be increased.

61. RN Martin advised:

> "[The EWS Chart] does not specify how frequent[ly] observations should be done but I would expect [that with an EWS score of 3] he should have had observations done hourly due to his respiratory failure and anxiety levels … Due to his EWS; at the minimum he should have been discussed with senior staff …"

62. RN Martin advised that the failure to specify the frequency of observations in the EWS Chart was a moderate departure from the expected standard of care.

63. I note that the EWS Policy states that a respiratory rate of between 20 and 29 breaths per minute has a value of 2. However, on the EWS Chart, a respiratory rate of 20 breaths per minute has a value of 0, but any patient who is receiving supplemental oxygen automatically scores 2.

64. In my view, the EWS Chart, which is the working document for staff, should reflect the EWS Policy. The EWS Policy specifies an hourly reassessment when the EWS is 3, but the EWS Chart does not specify how frequent the observations should be. I also note that the respiratory rate may be calculated differently depending on whether the EWS Policy or Chart is used. I am critical that the EWS Chart does not mirror the EWS Policy and that, as a result, it is not clear how the EWS should be calculated, and what steps should be taken when an EWS of 3 is calculated.

Nursing care provided to Mr A on the ward — breach

65. Mr A was assessed as being at a moderate risk of developing a pressure sore, and RN Martin advised that it would not be unreasonable to expect that Mr A would be turned over every 2–3 hours. However, I note that the Modified Braden Pressure Risk Assessment does not explicitly require this intervention.

66. At 7pm and 12.10am, EWS scores of 3 were calculated. At 10.45pm, an EWS was calculated at 0. This calculation failed to take into account a supplementary oxygen score of 2 and an oxygen saturation score of 1. This would have resulted in a score of 3. At 12.10am, Mr A's oxygen saturation level was recorded at 93%.

67. I share RN Martin's concerns about the EWS Chart, outlined above, and note that with an EWS score of 3, the EWS Policy requires hourly reassessment of vital signs. On two occasions, Mr A had an EWS score of 3, and therefore his vital signs should have been monitored every hour. I am critical that they were not.

68. RN Martin advised:

> "At 12.10am [Mr A's] … oxygen saturations [were] 93% [which] required a House Officer review within 20 minutes, escalation to nurse in charge and an increase in the frequency of vital sign monitoring. There is no evidence that these steps were followed and I am moderately critical of this."

69. I share RN Martin's concerns. The nurses did not follow the EWS Chart directions regarding the notification of a house officer when oxygen saturation levels started to deteriorate. Mr A's oxygen saturation level was recorded at 93%, and this should have triggered a review by a house officer within 20 minutes. I am critical that it did not.

70. RN Martin advised:

> "I am critical that despite [Mr A's] EWS of 3 with lowered oxygen saturations and his fragility, no further observations were recorded [after 1am] and he was found unresponsive at 4am. I find the failure to review [Mr A] after 1am to be a major departure from appropriate standards of care."

71. Two registered nurses who were caring for Mr A recorded an EWS of 3, and did not review him again for almost four hours. The EWS Policy states that hourly checks are required when an EWS of 3 is calculated. I am aware that the EWS Chart requires an "increase[d] frequency of vital sign monitoring", but does not outline a time frame for that expectation, and that Hutt Valley DHB considers that four-hourly observations were appropriate. However, I am guided by RN Martin's advice, and consider it unacceptable that a patient with an elevated EWS was not checked more frequently. As outlined above, I am critical of the lack of specificity in the EWS Chart as to how frequently observations should be undertaken. In addition, the EWS at 10.45pm was miscalculated and, because the elevated EWS was not recognised, a further opportunity to increase the frequency of observations was missed.

Conclusion

72. As detailed above, I have a number of concerns about the services and the care provided to Mr A:

- Mr A was not monitored adequately.

- The EWS Chart did not accurately reflect the EWS Policy, particularly in respect of the frequency of observations, and, as a result, the expectations for escalation were unclear.
- There was no policy for monitoring personal BiPAP machines. In the absence of a policy, observations should have been undertaken hourly.
- EWS scores of 3 were recorded at 7pm and 12.10am and, on each occasion, the score should have triggered hourly observations. An EWS score at 10.45pm should have been calculated at 3, which should also have triggered hourly observations.
- An oxygen saturation level of 93% was recorded at 12.10am, which should have triggered a review by a house officer and an increase in the frequency of the observation of vital signs.

73. Hutt Valley DHB is responsible for the operation of the clinical services it provides, and can be held responsible for any service failures. It is the responsibility of Hutt Valley DHB to have adequate systems in place to ensure that an acceptable standard of care is provided to consumers. This includes having appropriate policies, having working documents that accurately reflect those policies, and ensuring that the policies are complied with. For the reasons outlined above, Hutt Valley DHB failed to provide services with reasonable skill and care and, accordingly, breached Right 4(1) of the Code of Health and Disability Services Consumers' Rights.

Recommendations

74. I recommend that Hutt Valley DHB provide a formal written apology to Mrs A for the failures identified in this report. The apology is to be sent to HDC within three weeks of the date of this report, for forwarding to Mrs A.

75. I recommend that Hutt Valley DHB:

a) Amend the EWS Policy and EWS Chart to clarify:

   i. how an EWS is calculated when a patient has a domestic BiPAP;
   ii. the frequency of observations for each EWS; and
   iii. who is to be contacted when the EWS Escalation Protocol requires escalation, and how the contact person is to be contacted.

b) Develop a policy for the management of patients who are using a domestic BiPAP machine.

The new and amended policies should be provided to HDC within three months of the date of this report.

c) Provide evidence of recent training on the use of BiPAP machines and the policies relating to BiPAP machines and EWS. This evidence should be provided to HDC within six months of the date of this report.

Follow-up actions

76. A copy of this report with details identifying the parties removed, except Hutt Valley DHB and the experts who advised on this case, will be sent to the Health Quality & Safety Commission and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent advice to the Commissioner

The following expert advice was obtained from Registered Nurse Karla Martin:

"**DATE:** 14 July 2018

Thank you for the request that I provide clinical advice in relation to the complaint on case number 16/00823, from [Mrs A] concerning the care provided by [the public hospital] to her husband the late [Mr A]. In preparing the advice on this case to the best of my knowledge I have no personal or professional conflict of interest. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

I have a Bachelor of Nursing Degree and a Post Graduate Certificate in Intensive Care Nursing. I registered in December 1998. I have worked for 17 years in general Intensive Care/High Dependency Care and coordinate in the Acting Charge Nurse role when required. My experience includes: Nursing patients from a variety of medical and surgical areas including: trauma, neurological, multi organ failure, organ transplantation, sepsis, elective postoperative cases and cardiac surgery.

I have reviewed the documents on file: the received complaint from [Mr A's] Wife, [Mrs A], Hutt Valley DHB's response, Clinical records from Hutt Valley DHB and clinical records from [a second district health board] including [Mr A's] Respiratory Medicine Sleep Treatment Summary and Hutt Valley DHB's Non Invasive Ventilation policy.

Throughout this report I have applied the following professional standards —

Nursing Council of New Zealand (2012) Code of conduct.

Nursing Council of New Zealand (2007) Competencies for registered nurses.

Provided factual summary

On [Day 1], [Mr A] was admitted after being unwell for four days with symptoms of a cold and fever. The plan was for overnight observation and for [Mr A] to be discharged the following day. [Mr A] required a respiratory mask most of the time to assist with his breathing, and had taken his own BIPAP (Bi-level) machine to hospital with him. It is noted in his previous medical history that he suffers from anxiety and panic attacks secondary to respiratory failure.

At 7.40pm that evening, a nurse gave him paracetamol. [Mrs A] gave [Mr A] his sedative and put [Mr A's] respiratory mask back on, and she then left.

[Mr A's] last documented check from hospital staff occurred at 1am. The Bi-level machine data shows that oxygen supply stopped at 3am, but [Mrs A] reports that due to daylight saving, the time at which the oxygen stopped would have been 2.20am.

At 4am on [Day 2], [Mr A] was found lying backwards across his bed with his feet nearly touching the floor, without his respiratory mask on. We have been told he could not reach the call bell in that position, and passed away unexpectedly at some point during the night.

1. The reasonableness of the care provided by the nursing staff at [the public hospital] during [Mr A's] admission, particularly in relation to his use of a private Bi-level ventilator.

[Mr A] presented on [Day 1] to the [public hospital] Emergency Department (ED) before being admitted to the [ward]. His background medical history includes motor neuron disease with generalized weakness and type 2 respiratory failure. The month prior, [Mr A] had sustained a fall resulting in a small traumatic brain bleed. At home, [Mr A] walked with a frame and received twice-daily cares seven days a week provided by [a community health service]. [The] ED medical assessment note advises … *Impression — ? lower respiratory tract infection. Symptoms suggestive but exam and CXR not supportive of this. However at high risk of developing pneumonia post URTI due to MND.*

Documentation provided from [Mr A's] respiratory medicine sleep treatment summaries dated from October 2014 to […] 2015 show that [Mr A] needed to be on Bi-level ventilator support for longer periods (up to 14 hours a day) and needed the ventilator support settings increased. The ED front sheet and ED medical assessment note both report that [Mr A] was receiving BIPAP 24 hours.

The Hutt Valley DHB Adult Non Invasive Ventilation (NIV) policy states that the nurse/patient ratio should be 1:1 or 1:2 for the first eight hours shift of therapy and then as required per clinical assessment. As [Mr A's] admission diagnosis presumed respiratory infection coupled with his known medical history and BiPAP needs, I consider that he warranted closer nursing observation and placement in an HDU setting. If lack of HDU bed availability meant that [Mr A] had to be placed within a non HDU environment, I consider that he required nursing at 1:2 nurse/patient ratio. The NIV policy also advises that such patients should have observations (BiPAP machine settings, mask fit, and patient's level of alertness) recorded hourly or as clinically indicated. In my opinion, [Mr A] should have received this level of monitoring.

Upon admission to the ward, [Mr A] received appropriate assessments in relation to his falls risk and sustaining pressure ulcers. He was assessed at high risk for a fall due to him being on sedatives (clonazepam), being weak and having a mobility deficit due to his motor neuron disease. The falls risk prevention plan is ticked to indicate that cot sides on the bed should be up on settling and the call bell is accessible. These interventions are appropriate for a patient like [Mr A] who was consistently assessed as being alert GCS 15/15.

[Mr A's] risk for sustaining a pressure ulcer identified him at moderate risk. Based on this assessment, I consider that he would have required a static mattress (pressure mattress) and if not available two to three hourly turns to prevent skin integrity breakdown. If the Commissioner determines that [Mr A] did not receive interventions — regular turns or

appropriate pressure mattress — to manage his identified risk, then I would be moderately critical of this. Should the Commissioner determine that nursing staff provided [Mr A] with an appropriate standard of care in relation to management of this risk but failed to document this, then my criticism would be mitigated and I would recommend that the nursing staff involved are reminded of the expectations of Nursing Council of New Zealand in relation to contemporaneous clinical documentation and care planning.

Unfortunately the registered nurse on the evening shift has not signed for her notes and I would view this as a mild departure from accepted nursing documentation practice[1].

Based on [Mr A's] noted risk assessments; known history and presumed diagnosis, I consider he received suboptimal care. In my opinion he should have received care in accordance with the Hutt Valley DHB NIV policy — hourly checks to ensure the Bi-level ventilator was working as intended[2]. I am concerned that this level of care was not provided to him. My fellow colleagues and I would see this as a major departure from accepted standards of care.

2. The monitoring of [Mr A] between 7.40pm on [Day 1] and 4am on [Day 2].

The Hutt Valley DHB NIV policy also advises that continual oxygen saturation monitoring should also be in place when a patient is on NIV. In addition, the policy requires a patient's blood pressure, pulse, respiration, temperature and oxygen saturation to be recorded hourly for the first eight hours of therapy (at a minimum) or if the patient is assessed as unstable. These observations are required at four hourly intervals once the patient's condition is assessed as stable.

The supplied clinical notes do not include a NIV nursing observation form so my review is limited to the clinical notes and the supplied Vital Signs Chart. The vital signs chart shows [Mr A] had observations taken at 7pm, 10.45pm and 12.10am. [Mr A's] need for supplemental oxygen meant that his Early Warning Score (EWS) was a minimum of 2. Based on my calculation, [Mr A's] EWS was 5 at 7pm (3 is recorded) and 3 at 10.45pm (0 is recorded). At 7pm, [Mr A's] received paracetamol and cooling cares to manage his elevated temperature of 38.7 degrees. These are appropriate interventions[3]. I note that an EWS 1–5 require[s] an increase in the frequency of vital sign monitoring but lacks any further specificity. At 12.10am, [Mr A's] EWS is recorded as 3, while I agree with this calculation I note that his oxygen saturations 93% required a House Officer review within 20 minutes, escalation to nurse in charge and an increase in the frequency of vital sign monitoring. There is no evidence that these steps were followed and I am moderately critical of this. My criticism of this omission would be mitigated if nursing staff had reassessed [Mr A's] oxygen saturations and this had demonstrated an improvement.

[1] Nursing Council of New Zealand (NCNZ), *Code of conduct for nurses.* (Wellington: NCNZ, 2012)
[2] On 26 July 2018, Ms Martin clarified by email: "Because there is no protocol for home Bi level ventilation in the hospital setting I would expect he should have received the same care as someone on hospital Bi level ventilation — hourly checks."
[3] Nursing Council of New Zealand (NCNZ), *Code of conduct for nurses.* (Wellington: NCNZ, 2012)

At 12.45am it is documented in nursing clinical notes by [RN C] that [Mr A] was incontinent, which required him to sit in a chair while his bed was cleaned. Following this Bi-level ventilator was restarted and the registered nurse confirmed that the machine was working by putting her hand against the mask before she placed the mask onto his face. At 1am it is documented that [Mr A] was asleep in bed. I am critical that despite [Mr A's] EWS of 3 with lowered oxygen saturations and his fragility, no further observations were recorded and he was found unresponsive at 4am. I find the failure to review [Mr A] after 1am to be a major departure from appropriate standards of care.

3. The adequacy of relevant policies and procedures in place at [the public hospital], including the lack of guidelines that exist for domestic machine use on general wards.

In general, I consider the relevant policies and procedures to be appropriate although I note that it was overdue for an update when [Mr A] was admitted. In my opinion, Hutt Valley DHB would not be the only health care provider whose NIV policy is focused on the commencement of NIV as a new therapy. Clearly as this complaint shows such a focus is insufficient. I do note that [the] Quality Advisor for Hutt Valley DHB advises that the NIV policy is currently in the process of being rebuilt. I agree this is appropriate and would recommend that the updated policy addresses the need for appropriate alarms setting and guides nursing staff on their responsibilities in relation to being able to run and troubleshoot a patient's own Bi-level ventilator.

I agree with the policy requirement that care of a patient receiving NIV needs to be limited to areas where there are available NIV competent nursing staff and at appropriate levels. The policy advises that appropriate areas are Acute Medical Wards, Emergency Department and High Dependency Units. I am unsure if the [ward] is classed as part of these areas. The NIV policy does include guidance if a patient who requires NIV cannot be placed in one of the specified areas or for situations where a NIV competent nurse is unavailable. Such considerations are necessary. I am unsure to what extent location and staff concerns were considered prior to [Mr A] leaving the ED and would be moderately critical if the commissioner determines that appropriate consideration was not given.

4. Any other matter I consider relevant to comment on.

I find it concerning that despite recognition of [Mr A's] requirement for Bi-level ventilation; he was not commenced on the NIV therapy assessment form. In my opinion, this failure facilitated the further incidences of suboptimal care. This is not to say that this failure led to [Mr A's] death.

I strongly disagree that it is appropriate to nurse a patient on NIV in an environment where they cannot be easily sighted. I note that the documentation provided advises that [Mr A's] curtains were closed around his bed over the course of the night.

I find it concerning that there is no documentation of what was said at a meeting held with [Mrs A] immediately following her husband's death. In addition, there is no documentation concerning the meetings held with [Mrs A] and Hutt Valley DHB on 23 September and 16

October 2015. It is accepted practice amongst my peers and myself that all meetings are documented. This includes date and time of the meeting, who attended and what was said.

I question whether staff nurse [RN C] was suitably trained and experienced to care for a patient on NIV. I would be critical that she was allocated a patient who was not in a position to manage his Bi-level ventilator machine himself if she had not completed the NIV training day and achieved the necessary level of competency. I also have concerns about the level of support available to [RN C] and whether the Duty Nurse Manager was aware that a patient requiring NIV was admitted to the ward. From the information supplied, I am unable to comment on whether the total patient load allocated to [RN C] negatively impacted on her ability to adequately monitor [Mr A] and check his vital signs at appropriate intervals.

There is conflicting documentation from [RN C] in regards to whether [Mr A's] call bell was on the left or right side of the bed when he was found unresponsive. Given her comments … were given 2 months after the event I do not consider it surprising that her recollection may be unclear.

From the documentation provided it appears [RN C] no longer works at Hutt Valley DHB, however I would hope further training is provided to those that work there and that their yearly audits are up to date. I would expect that even with training it is still paramount to ensure that when caring for someone who is on Bi-level ventilation staff feel appropriately supported and able to raise any concerns.

There is no documentation provided regarding what further training and education has been done to prevent this situation from occurring again.

Karla Martin (RN, PG Cert)"

Further expert advice dated 26 July 2018:

"Because there is no protocol for home Bi level ventilation in the hospital setting I would expect he should have received the same care as someone on hospital Bi level ventilation — hourly checks."

Further expert advice dated 10 September 2018:

"I have looked over the EWS protocol and my advice still applies to [Mr A]. There was a moderate departure of care. The protocol does not specify how frequent[ly] observations should be done but I would expect he should have had observations done hourly due to his respiratory failure and anxiety levels. There is no documentation about conversations had or any escalation in his care. Due to his EWS; at the minimum he should have been discussed with senior staff (the nurse in charge and to the CNS)."

Further expert advice dated 12 May 2019:

"I have reviewed the guidelines for the modified Braden pressure risk interventions. Given [Mr A's] previous history of motor neuron disease with generalized weakness and falls and him being on clonazepam I don't think it's unreasonable to have expected [Mr A] to be turned 2–3 hourly."

Appendix B: Independent advice to the Commissioner

The following expert advice was obtained from Dr Richard Shepherd, general physician:

"My name is Dr Richard Shepherd. I have been asked to provide an opinion to the Commissioner on case number C16HDC00823 regarding the care [Mr A] received from the Hutt Valley District Health Board. I have read and agree to follow the Commissioner's Guidelines for Independent Advisors.

I am a Consultant General Physician employed by the Waikato District Health Board. I graduated from Otago Medical School in 1997 with Bachelor of Medicine and Surgery (MBChB). I have attained fellowships with the Royal New Zealand College of Urgent Care, The Division of Rural Hospital Medicine and the Australasian College of Physicians. I have subspecialty interests in nephrology, emergency medicine and palliative care. I have completed the Auckland University Postgraduate Diploma of Community Emergency Medicine, the RACP Clinical Diploma in Palliative Medicine and the Otago University Certificate in Physician Performed Ultrasound. I have no conflicts of interest to declare in this case.

I have been requested by the Commissioner to provide expert advice on the following issues:

Please review the enclosed documentation and clinical notes and advise whether you consider the care provided to [Mr A] by medical staff was reasonable in the circumstances, and why. In particular, the commissioner is seeking your opinion regarding [Mr A's] clinical management, including his transition into the [ward]. For clarity, this office requires your comment only with regard to the medical care provided, and has sought separate advice regarding nursing care.

In particular please comment on:

1/ The care provided by medical staff on [the ward];

2/ The adequacy of the care plan for [Mr A] on admission to [the ward];

3/ The adequacy of the observations of [Mr A] while in [the ward];

4/ The adequacy of relevant policies and procedures in place at [the public hospital];

5/ Any other matters in this case you consider warrant comment.

For each question I have been requested to advise:

a) What is the standard of care/accepted practice?

b) If there has been a departure from the standard of care or accepted practice, how significant a departure it is in my view.

c) How would the departure be viewed by my professional peers?

d) Recommendations for improvement that may help to prevent a similar occurrence in the future.

My advice has only been sought with regard to the medical care provided with separate advice sought regarding nursing care.

Sources of information reviewed in the preparation of this report:

Letter of complaint from [Mrs A] dated […]

Clinical record from Hutt Valley DHB (email 1 dated 2 August 2016)

Clinical records from [a second DHB]

Response from Hutt Valley DHB (email 2, dated 3 August 2016)

Response from Hutt Valley DHB dated 14 September 2017

[…] manufacturer Information Guide.

Overview:

[Mrs A's] complaint concerns Hutt Valley DHB's failure to adequately supervise and care for her husband [Mr A] during his [admission to the public hospital].

[Mr A] was admitted after being unwell for four days with symptoms of a cold and fever. The plan was for overnight observation and for [Mr A] to be discharged the following day. [Mr A] used a long term respiratory non-invasive ventilator device to support his respiratory function particularly whilst asleep. This had been commenced in October 2014 for type II respiratory failure due to underlying deteriorating motor neuron disease. [Mr A] brought his own device to hospital with him to use.

On [Day 1], at 7:40pm a nurse gave [Mr A] paracetamol. [Mrs A] gave [Mr A] his evening sedative medication and put [Mr A's] respiratory mask on then she left the hospital for the evening.

[Mr A's] last documented check from hospital staff occurred at 1am on [Day 2].

At 4am on [Day 2], [Mr A] was found lying unresponsive across his bed without his respiratory mask on. He passed away unexpectedly at some point during the night.

His Bi-pap machine data recorded that oxygen supply stopped at approximately 2:20am.

Advice to the Commissioner:

1/ *The care provided by medical staff on [the ward].*

In my opinion the care provided to [Mr A] by the medical staff on [the ward] was adequate and did not deviate from the expected standard of care.

In defining that expected standard of care: it would be anticipated that a patient would be admitted to the [ward] having been assessed by medical staff, investigated appropriately with a diagnostic impression or problem list defined and a management plan put in place for their subsequent in-hospital care. It would also be expected that such details would be adequately documented to allow ongoing care.

In [Mr A's] case he was assessed by an emergency department registrar at Hutt Valley DHB with notes documented at 14:23hrs [Day 1]. Initial investigations consisting of blood tests and a chest X-Ray were organised, and an impression formed of a LRTI (Lower Respiratory Tract Infection)/pneumonia. He was commenced on antibiotics and IV fluids. [Mr A] was considered to be likely to need admission to hospital at that stage and consequently referred to the General Medical Team. He was reviewed by a Medical House Officer with notes documented at 18:42hrs. Results of his investigations were reviewed including his Chest X-Ray, ECG and blood results. A diagnosis of likely LRTI was again made noting [Mr A] was at high risk of developing pneumonia due to his underlying motor neuron disease. A plan was made for admission to the [ward] with his antibiotics continued and to continue on his own Bi-pap machine. [Mr A] appears to have been transferred to the [ward] from the emergency department between approximately 18:30hrs and 19:00hrs. [Mr A] was then further reviewed by the Medical Registrar at 21:44hrs with agreement regarding the previous findings and plan. Chest physiotherapy was also suggested for the following morning.

In my opinion the assessment, investigation, management and documentation of the above interactions by the involved medical staff would meet the expected standard of care. I would regard my colleagues as holding a similar view.

Perhaps missing from that comprehensive assessment would be the documentation regarding [Mr A's] resuscitation wishes and anticipated ceilings of care should he deteriorate unexpectedly. I would however acknowledge at that stage he was not regarded as being significantly unwell and was not expected to pass away that night.

2/ *The adequacy of the care plan for [Mr A] on admission to [the ward].*

In my opinion the care plan provided to [Mr A] by the medical staff on [the ward] was adequate and did not deviate from the expected standard of care. I would apply the same comments as noted above in question 1.

3/ *The adequacy of the observations of [Mr A] while in [the ward].*

In my opinion [Mr A's] observations while in the [ward] were adequate given the circumstances and would meet the expected standard of care.

In defining that standard of care: In general terms the frequency of observations would generally be anticipated at a 4 hourly interval for acute [ward] patients deemed to be stable. Such observations would be entered into a vital signs chart with a default early warning score (EWS) trigger system in place to alert staff to potential

deterioration and guide modification of subsequent observation frequency if deterioration occurred. Such systems are in common use and now represent the national standard. It would not generally be anticipated that medical staff would specifically document the frequency of observations to be done by nursing staff — unless specific concerns or clinical circumstances existed that might be judged to modify standard practice.

In [Mr A's] case his initial medical assessment and observations in the ED did not mandate more frequent initial plans beyond anticipated routine observations. His [ward] observations were recorded at 19:00hrs, 22:45hrs and 00:10hrs. Early warning scores of between 0–3 were noted with no indication that deterioration was occurring or that more frequent observations were therefore indicated. Escalation of his observation frequency as per the EWS was not indicated.

Following his admission to the [ward] he appears to have been further medically assessed by the medical registrar at 21:44hrs. No additional concerns were noted which would have suggested further routine medical review overnight was indicated.

In my opinion the routine use of [Mr A's] own Bi-pap machine did not in of itself mandate an alteration to his observation frequency or require the adoption of protocols intended for patients with acute respiratory failure being started and titrated onto non-invasive ventilation. In my view that was not the circumstances of [Mr A's] presentation or subsequent clinical condition. No departure from his daily routine use and settings of his own Bi-pap machine was deemed necessary. I note [Mr A's] daily use of his Bi-pap machine dated back to October 2014. In my view application of acute protocols, blood gas interventions and intensive monitoring to a deemed stable patient managed on long term Bi-pap would not have been necessary, or appropriate in the circumstances.

4/ *The adequacy of relevant policies and procedure in place at [the public hospital].*

In my opinion the adequacy of the policies and procedures in place at [the public hospital] at the time of [Mr A's] care did not likely fall below the accepted standard of care. In my view standard monitoring, EWS use and [the ward] care were appropriate.

Given [Mr A's] longstanding comorbidities (his significant motor neuron disease requiring NIV, and recent cerebral bleed) in my opinion consideration of his resuscitation status and ceilings of care should have been considered and discussed. The specific DHB policy regarding that was not provided to me though referred to in the NIV 2017 draft document as present since January 2009.

At the time of [Mr A's] care there was no policy or procedure in place to guide the use of a patient's own Bi-pap machine within the inpatient ward. As per the response from the Hutt Valley DHB — 'Patients requiring Bi-pap for type II respiratory failure were treated in ED or admitted to ICU/HDU for therapy on hospital equipment. If active

nurse management was deemed to be necessary, [Mr A] would have been admitted to ICU/HDU and care would have been given on hospital equipment.'

In [Mr A's] circumstances he was not assessed as requiring adjustments to his usual Bi-pap regimen and therefore was deemed appropriate to remain on his own machine. I would struggle to be critical of such decision making.

A copy of the Hutt Valley DHB 2017 draft non-invasive ventilation (NIV) guideline was provided to me which includes a non-invasive ventilation assessment and prescription form plus nursing observation chart specific to NIV. The documentation is clear, detailed, specific and practical including noting that specific training in NIV is also required, with the NIV policy and procedure not replacing adequate training. It also associates the 'Do Not Attempt Resuscitation Record Document January 2009' and therefore consideration regarding ceilings of care.

I would also note the above policy specifically excludes patients maintained on home NIV who are deemed to be stable and not requiring alteration to their usual NIV prescription.

The hospital machine NIV policy in place at the time of [Mr A's] care (2015) was not provided to me. I would however agree with the DHB response that as [Mr A] was maintained on his own machine it would not actually have been specifically applicable to him.

In my view any such policy specific to the use of a patient's own NIV would have been unlikely to have added to the care [Mr A] received in his circumstances. If assessed by the medical team as stable and not requiring alteration to his usual NIV settings (as [Mr A] was at the time of his first (14:23hrs), second (18:42hrs) and third (21:44hrs) medical assessments) his usual NIV would have been appropriately continued — a policy merely stating that, would not have added significantly to his care. Had he been assessed as having developed worsening respiratory failure or likely to require alteration to his usual NIV settings then consideration of use of a hospital machine with application of the relevant NIV policy and procedure would then have been appropriate.

5/ *Any other matters in this case you consider warrant comment.*

[Mr A] was found deceased. No post-mortem was performed to precisely determine his cause of death. His death certificate was completed as acute respiratory failure secondary to pneumonia as a consequence of underlying motor neuron disease. Piecing together the circumstances of his death in my opinion is challenging and open to interpretation and speculation. [Mr A] was suffering from progressive motor neuron disease and did require NIV. He also had a diagnosis of likely amyloid angiopathy with multiple previous micro haemorrhages and a small thalamic bleed approximately a month earlier … In my opinion he was at risk of potential sudden death on the basis of his significant comorbidities. In my opinion [Mr A] was appropriately assessed,

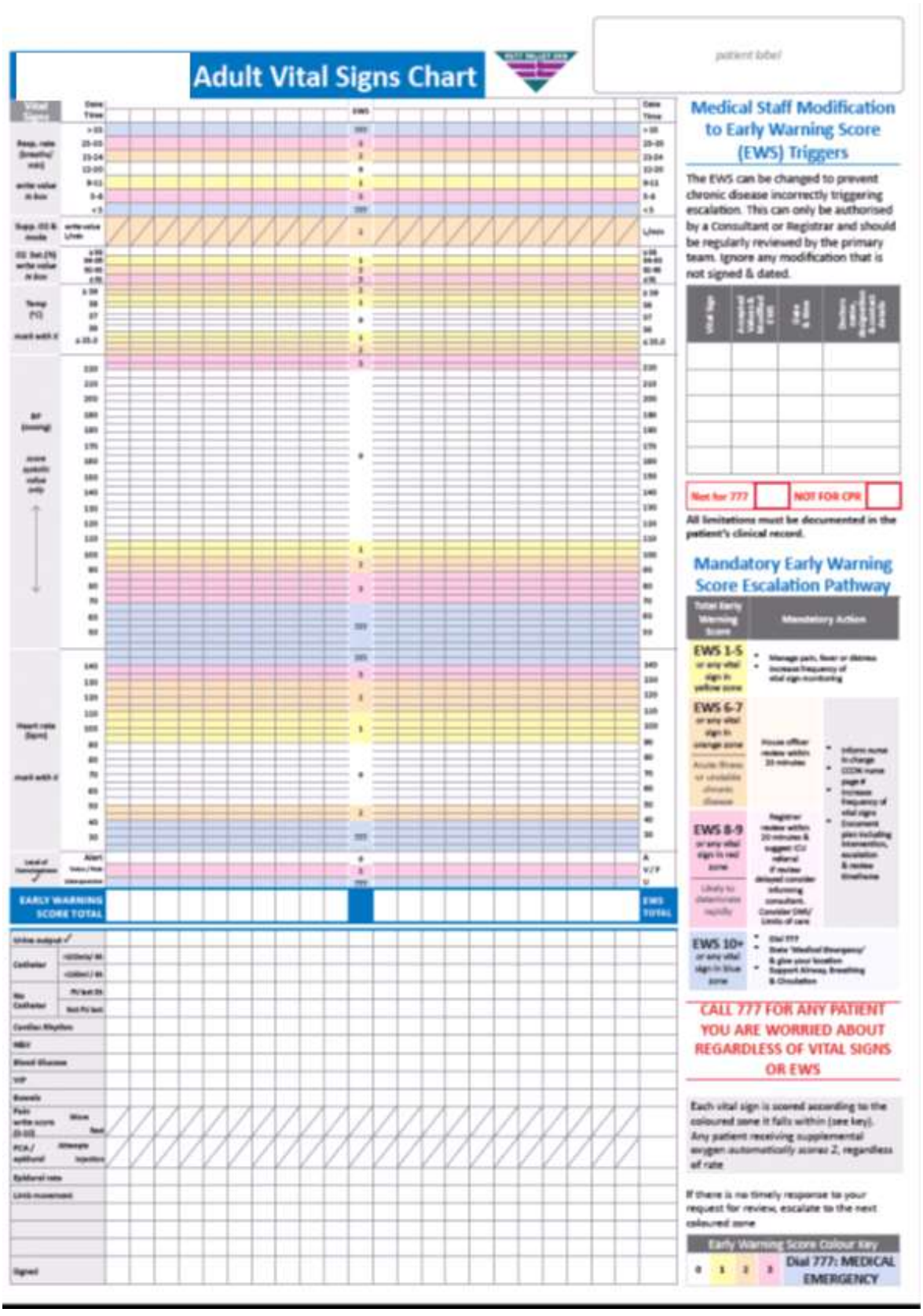
monitored and investigated for his acute presentation with the medical documentation provided also at the expected standard of care. With what was known at the time of his presentation — in my view his admission to [the ward] was appropriate, the use of his own Bi-pap machine was appropriate, and the application of standard monitoring and EWS use also appropriate.

With the benefit of hindsight and knowledge of [Mr A's] death, retrospective consideration regarding increased monitoring, altered care, or differing care plans could be considered. In my view though I would struggle to be critical of events as they unfolded, acknowledging the ability to accurately predict a patient's trajectory is not an exact science. I would find it difficult to be certain that [Mr A's] outcome would have been altered despite differing policies, or procedures, or more intensive monitoring.

Defining his ceiling of care and expectations regarding his care in the event of an acute deterioration would, in my opinion, have been a potentially useful intervention. Such an investment in open communication at the time of admission and treatment planning may have had the potential to significantly influence the ramifications of later otherwise unexpected outcomes.

Dr Richard Shepherd Date: 14/03/2018
Consultant Physician General Medicine
Waikato District Health Board
MBChB FRACP"

Appendix C: EWS Chart



Adult Vital Signs Chart

patient label

Medical Staff Modification to Early Warning Score (EWS) Triggers

The EWS can be changed to prevent chronic disease incorrectly triggering escalation. This can only be authorised by a Consultant or Registrar and should be regularly reviewed by the primary team. Ignore any modification that is not signed & dated.

Vital Sign	Assigned Value(s) & Trigger(s)	Date & Time	Doctors name, designation & contact details

Not for 777 | NOT FOR CPR

All limitations must be documented in the patient's clinical record.

Mandatory Early Warning Score Escalation Pathway

Total Early Warning Score	Mandatory Action
EWS 1-5 or any vital sign in yellow zone	• Manage pain, fever or distress • Increase frequency of vital sign monitoring
EWS 6-7 or any vital sign in orange zone Acute illness or unstable chronic disease	House officer review within 30 minutes • Inform nurse in charge (CCDM nurse) • page if increase frequency of vital signs • Escalation plan including intervention, escalation & review timeframe
EWS 8-9 or any vital sign in red zone Likely to deteriorate rapidly	Registrar review within 20 minutes & suggest ICU referral If review delayed consider informing consultant. Consider DNR/ Limits of care
EWS 10+ or any vital sign in blue zone	• Dial 777 • State 'Medical Emergency' & give your location • Support Airway, Breathing & Circulation

CALL 777 FOR ANY PATIENT YOU ARE WORRIED ABOUT REGARDLESS OF VITAL SIGNS OR EWS

Each vital sign is scored according to the coloured zone it falls within (see key). Any patient receiving supplemental oxygen automatically scores 2, regardless of rate

If there is no timely response to your request for review, escalate to the next coloured zone

Early Warning Score Colour Key				
0	1	2	3	Dial 777: MEDICAL EMERGENCY

Names have been removed (except Hutt Valley DHB and the expert who advised on this case) to protect privacy. Identifying letters are assigned in alphabetical order and bear no relationship to the person's actual name.