Bay of Plenty District Health Board

Registered Nurse, RN C

Registered Nurse, RN D

Registrar, Dr G

A Report by the

Health and Disability Commissioner

(Case 15HDC00643)

Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

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Executive summary

1. At the time of these events, Mr A was aged 83 years and had a history of severe end-stage chronic obstructive pulmonary disease with pulmonary hypertension. On Thursday, Mr A presented to the Emergency Department (ED) at a public hospital following a referral from his general practitioner, who reported that Mr A was "feeling terrible" and had an SpO_2 of 75%. Mr A was assessed by an ED registrar and commenced on bi-level positive airway pressure therapy (BiPAP). He was also assessed by a general medical and respiratory consultant, Dr I, who instructed that Mr A continue with BiPAP, and specified that his SpO_2 levels should be maintained between 88–92%. Mr A was then admitted to the Admissions Planning Unit and, on Friday, transferred to the ward.

2. On Saturday, Mr A was off BiPAP from 9.30am until he was reviewed by medical registrar Dr G at 1.45pm. Dr G made a plan to maintain Mr A's SpO_2 levels between 85–92% and instructed that if they were "persistently" less than 85% then Mr A was to be put back on BiPAP. Dr G did not record any instruction about the oxygen delivery system to use if Mr A was unable to tolerate BiPAP. At 4.30pm Mr A's SpO_2 was 94%, and house officer Dr H prescribed Mr A clonazepam and morphine elixir. Dr H did not consult Dr G before doing so.

3. At 6pm Mr A was drowsy and his SpO_2 was 72%. Dr H reviewed Mr A and contacted Dr G, and a plan was made to move Mr A to a side room. A senior medical officer was not informed of Mr A's deterioration. At 9.25pm Dr H specified that Mr A's SpO_2 levels were to be maintained between 85–92%, and stated that if he was not tolerating BiPAP then nursing staff could trial removing it. At 9.30pm Mr A's SpO_2 was 98% and, at 10.50pm, a line graph indicates that it was 98–100%. BiPAP was also discontinued some time after Dr H's review and recommenced in the early hours of Sunday following medical instruction that BiPAP be recommenced.

4. On Sunday morning, Dr G reviewed Mr A and instructed that his SpO_2 levels were to be maintained between 85–90%, and that he be continued on BiPAP "as tolerated". At 11am, Mr A's SpO_2 was 90%, and this is the last entry in the BiPAP observation chart. RN C worked the afternoon shift on Sunday and recorded in the clinical notes that Mr A remained critically unwell, was restless, and had desaturated to an SpO_2 of 60%. She recorded that Mr A was not tolerating BiPAP and that she had used a non-rebreather mask alternated with nasal prongs. Throughout the remainder of her shift, RN C recorded that Mr A's SpO_2 was between 91–92%.

5. At 10.45am on Monday, Mr A was commenced on comfort cares. Sadly, at 2.50pm Mr A died.

Findings

6. Bay of Plenty District Health Board breached Right 4(1) of the Code[1] by failing to ensure that Mr A received an acceptable level of care. It was noted that staff inappropriately utilised oxygen delivery systems; Mr A was administered oxygen

[1] Right 4(1) of the Code of Health and Disability Services Consumers' rights states: "Every consumer has the right to have services provided with reasonable care and skill."

therapy despite his SpO_2 levels being higher than the upper limit prescribed by the medical team; nursing staff failed to appreciate that Mr A had been prescribed BiPAP because of his hypercapnic respiratory failure; the management plan for the use of BiPAP was not communicated to nursing staff effectively; the nursing staff did not inform the medical team when they struggled to maintain Mr A on BiPAP, or when Mr A's observations indicated the need for a medical review; the medical staff made decisions without consultation with more senior staff, and did not seek more senior medical input when indicated; and the oxygen delivery protocol did not contain guidance about the use of high flow oxygen in patients, and the non-invasive ventilation (NIV) protocol had conflicting information about starting pressures.

7. RN D breached Right 4(1) for failing to maintain Mr A's SpO_2 levels within the documented plan and to seek a medical review when she was unable to maintain Mr A on BiPAP, and for being unaware that Mr A had been prescribed clonazepam to help him tolerate BiPAP.

8. RN C breached Right 4(1) for failing to seek a medical review when Mr A became hypoxic, and for not managing his oxygen therapy adequately. Adverse comment was also made regarding RN C's documentation.

9. Dr G breached Right 4(1) for failing to specify the correct SpO_2 levels or record instruction about the oxygen delivery system to use if Mr A was unable to tolerate BiPAP treatment. Dr G also missed an opportunity to have a senior medical officer review Mr A's condition and treatment plan.

Recommendations

10. It is recommended that Bay of Plenty District Health Board consider producing a guideline on prescribing sedation for patients with NIV; review nurse-to-patient ratios and the availability of equipment in the respiratory ward; review the training provided to nursing staff regarding the management of NIV and patients at risk of respiratory failure; provide education to clinical staff on documentation; include information within training material that asking questions and reporting concerns is expected from all members of the multidisciplinary team; and provide HDC with a report confirming the implementation of recommendations following its internal investigation into these events.

11. It is recommended that RN C arrange for education and training on when to seek a medical review of a patient who is restless and agitated and requires one-on-one nursing care. It is also recommended that RN C amend her practice to ensure that she consistently follows the early warning triggers specified on observation charts and/or seeks a medical review of a patient so that vital sign parameters are changed appropriately.

12. In response to my provisional opinion, Bay of Plenty District Health Board and RN C supplied HDC with an apology letter to Mr A's family. It is recommended that RN D and Dr G apologise to Mr A's family for the failings identified in this report.

Complaint and investigation

13. The Commissioner received a complaint from Mr B about the services provided to his father, Mr A (dec), by Bay of Plenty District Health Board. The following issues were identified for investigation:

- *Whether Bay of Plenty District Health Board provided Mr A with an appropriate standard of care in 2015.*
- *Whether RN C provided Mr A with an appropriate standard of care in 2015.*
- *Whether RN D provided Mr A with an appropriate standard of care in 2015.*
- *Whether Dr G provided Mr A with an appropriate standard of care in 2015.*

14. The parties directly involved in the investigation were:

Mr B	Consumer's son
Bay of Plenty District Health Board	Provider
RN C	Registered nurse
RN D	Registered nurse
RN E	Registered nurse
RN F	Registered nurse
Dr G	Registrar
Dr H	House officer
Dr I	Consultant

Also mentioned in this report:

Dr J	Medical registrar
Dr K	House officer
Dr L	Medical registrar
RN M	Registered nurse
RN N	Registered nurse
Dr O	Locum consultant
Dr P	Medical Leader for Medical Services
Dr Q	Senior medical officer
RN R	Nurse leader
RN T	Registered nurse

15. Information from the Coroner was also reviewed.

16. Independent expert advice was obtained from a respiratory and general physician, Dr Conroy Wong (**Appendix A**), and in-house nursing advice was obtained from Registered Nurse (RN) Dawn Carey (**Appendix B**).

Information gathered during investigation

Introduction

17. Mr A, aged 83 years at the time of these events, was living in his own home with some assistance.[2] He had a history of severe end-stage chronic obstructive pulmonary disease (COPD)[3] with pulmonary hypertension.[4]

Presentation to GP

18. At approximately 10am on Thursday, Mr A presented to his general practitioner (GP) with his son, Mr B. Upon assessing Mr A, the GP referred him to the medical registrar at the public hospital. The GP noted in his referral letter that the previous month Mr A had been away to visit his family and, while there, had developed a cold. The GP included that Mr A had said that he had been "feeling terrible" and that his blood oxygen saturation level (SpO_2)[5] was 75%[6] on room air and his respiration rate was 32 breaths per minute.[7]

Thursday — admission to the public hospital

19. At 12.20pm, Mr A arrived at the Emergency Department (ED) at the public hospital and was given a triage code of 2.[8] At 12.30pm, Mr A was prescribed salbutamol[9] and ipratropium.[10] At 1pm, he was reviewed by a medical registrar, Dr J. At that time Mr A's pulse was 90 beats per minute (bpm),[11] his blood pressure was 120/75mmHg,[12] his respiration rate was 28 breaths per minute, and his SpO_2 was 85% on one litre (1L) of oxygen.

[2] Mr A's son, Mr B, stated that, although his father was not well, he was able to manage with minimal cares.
[3] COPD is an umbrella term used to describe progressive lung diseases, including emphysema, chronic bronchitis, refractory (non-reversible) asthma, and some forms of bronchiectasis. COPD is characterised by increasing breathlessness.
[4] Pulmonary hypertension is high blood pressure in the arteries to the lungs. The blood vessels that carry blood from the heart to the lungs become hard and narrow, and the heart has to work harder to pump through the blood.
[5] Peripheral oxygen saturation (SpO_2) is an estimation of the oxygen saturation level in the blood, and usually is measured with a pulse oximeter device.
[6] For a healthy person, the SpO_2 should be around 94% to 99%. For patients with mild respiratory diseases, the SpO_2 should be 90% or above. Supplementary oxygen should be used if the SpO_2 level falls below 90%, which is unacceptable for a prolonged period of time.
[7] The respiratory rate is the number of breaths taken per minute. The normal respiration rate for an adult at rest is 12 to 20 breaths per minute. A respiration rate under 12 or over 25 breaths per minute while resting is considered abnormal.
[8] Imminently life-threatening or important time-critical, to be seen within 10 minutes.
[9] Salbutamol is used to treat cough, wheeze, and breathing difficulty caused by respiratory problems such as asthma and COPD. It works by opening up the air passages in the lungs.
[10] Ipratropium is a liquid solution that is inhaled via the mouth using either a nebuliser (a machine that turns medication into a mist that can be inhaled) or a puffer. Ipratropium is used to relax and open up the air passages to make breathing easier.
[11] A normal resting heart rate for adults ranges from 60 to 100bpm.
[12] Normal adult blood pressure is more than 90/60mmHg and less than 120/80mmHg.

20. Dr J reviewed Mr A and discussed his presentation with a general medical and respiratory consultant, Dr I. It was decided to commence Mr A on BiPAP[13] and to maintain his SpO_2 levels between 85–90%.[14] The BiPAP observation chart records that BiPAP therapy was commenced at 2pm. A chest X-ray was also performed at 1.30pm, and showed "left lower lobe pneumonia, with a smaller region of infection at the right lung base". Dr J also recorded that he discussed a "not for resuscitation" order with Mr A, and that a transfer to the High Dependency Unit (HDU) could be considered "for BiPAP but not appropriate for ventilation".

Review by Dr I and transfer to the Admissions Planning Unit

21. At 2.45pm, Dr I reviewed Mr A in the ED and recorded that he was "now more comfortable as on BiPAP [for] nearly one hour". She made a plan to continue BiPAP usage for the next 24 hours with breaks for eating and drinking, and specified an SpO_2 range between 88–92%.

22. Dr J discussed with an intensivist[15] the transferral of Mr A to the high dependency unit (HDU), but was told that the HDU was full. Dr J instead made a plan to transfer Mr A to the Admissions Planning Unit (APU). The nursing notes record that Mr A was transferred to the APU at 6.45pm, and was continued on BiPAP that evening.

Friday

23. At 8.40am, Dr I reviewed Mr A, and it is recorded that his SpO_2 was 88% and his respiration rate 20 breaths per minute, and that he felt better. Dr I explained to Mr A the importance of BiPAP and made a plan to administer IV (intravenous) fluids and encourage the use of BiPAP "for as long as possible" that day. At 2.15pm, Mr A was reviewed by a medical registrar, who instructed that Mr A be continued on BiPAP.

Transfer to the ward

24. At 8.30pm, Mr A was transferred from APU to a general medical ward (the ward). The overnight nursing notes record that Mr A's SpO_2 level was 91% and he was awake all night. It is also recorded that he had difficulty tolerating BiPAP and kept removing the mask. The on-call house officer, Dr K, was contacted, and he directed the use of BiPAP to continue overnight, and said that Mr A would be reviewed in the morning.

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[13] Bi-level positive airway pressure (BiPAP) is a non-invasive ventilation (NIV) therapy. A BiPAP device applies pressurised air using a mask with headgear and tubing. The patient wears the mask (either over the nose, or both the nose and mouth) to receive pressurised air. The mask delivers positive airway pressure to keep the airways open, preventing collapse of tissues and improving the exchange of oxygen (at inhale) with carbon dioxide (during exhale). A BiPAP delivers two levels of pressure — one that corresponds with the inhalation, and one that corresponds with the exhalation. A BiPAP machine also includes a breath timing feature that adapts to the user's respiratory patterns to relieve the overworked accessory breathing muscles.

[14] Some patients with COPD chronically retain carbon dioxide, and are hypoxic. In these cases the administration of too much oxygen can result in the patient retaining even more carbon dioxide. In all cases of hypoxia, oxygen saturation should be kept above 90%, but for patients with COPD, oxygen saturation should not exceed 93%, as this increases the risk of hypercapnia (i.e., when there is too much carbon dioxide in the bloodstream) and respiratory acidosis.

[15] An intensivist is a doctor who specialises in the care of critically ill patients, most often in an intensive care unit.

Saturday

25. Mr A was off the BiPAP from 9.30am until he was reviewed by a medical registrar, Dr G, at 1.45pm. Dr G recorded in the clinical notes that Mr A said that he felt better. Mr A's SpO_2 was stable at 89–92% on 2L/min of oxygen. Dr G's plan was to use "saline nebulisers[16] to help expectorate[17]", to maintain the SpO_2 at 85–90%, and, if Mr A's SpO_2 was "persistently" less than 85%, he was to be put back on the BiPAP.

26. RN D was the nurse responsible for looking after Mr A during the afternoon shift on Saturday. RN D told HDC that she was formally trained on BiPAP in 2004, and that having worked in an acute medical ward where oxygen therapy and BiPAP "is often implemented" she is "both familiar and confident with BiPAP and in the use of [oxygen] therapy equipment when caring" for patients. RN D stated that she has no recollection of Mr A or the events involved with his care. She stated that the only information she can provide is that which is documented in the clinical notes.

Transfer to bathroom

27. RN D recorded (time not specified but sometime in the afternoon before 4.45pm) that Mr A became short of breath following a transfer to the bathroom "without [oxygen] in place". With respect to the bathroom transfer, RN D told HDC:

> "I do not recollect that I was responsible for taking [Mr A] to the bathroom without [oxygen] on [Saturday evening]. My usual practice when transferring patients to the toilet who are short of breath, having difficulty breathing and/or have been on [oxygen] therapy is that I am aware and conscientious of the necessity for [oxygen] when transferring."

Increase in respiratory rate and notification of house officer

28. At 4.30pm, Mr A's respiration rate was 36 breaths per minute, and his SpO_2 was 94% on oxygen at 2L/min. The adult observation chart stated that when the respiration rate was greater or equal to 25 breaths per minute then the monitoring of a patient should be increased "to a minimum of one hourly" (i.e., observations should occur at least once every hour). The chart also stated that the registered nurse must "urgently inform the medical team caring for the patient", and that the patient must be assessed by the medical team urgently.

29. RN D recorded that she contacted the on-call house officer, Dr H, who charted clonazepam[18] and morphine elixir,[19] which she administered to Mr A at 4.45pm. At the time of these events Dr H had worked as a doctor for 13 months. Dr H did not record in the clinical notes the reason for the prescription. He told HDC that he

[16] A nebuliser is a machine that converts liquid medicine into particles that can be inhaled. Indications for nebuliser use include the management of exacerbations and long-term treatment of COPD.
[17] To "expectorate" is to cough or spit out phlegm from the throat or lungs.
[18] Clonazepam is a medication used to prevent and treat seizures and panic disorder, and for the movement disorder known as akathisia. It is a tranquilliser of the benzodiazepine class. Common side effects include sleepiness, poor coordination, and agitation. Dr H prescribed 1–2 drops of clonazepam as required.
[19] Morphine is a pain medication of the opiate type. Potentially serious side effects include a decreased respiratory effort and low blood pressure. Dr H prescribed 2.5mg four times a day as required.

prescribed morphine and clonazepam "as an attempt to improve [Mr A's] tolerance of BiPAP". Dr H stated that he had worked with the respiratory team previously, and frequently had seen morphine and clonazepam prescribed to help patients tolerate BiPAP.

30. Dr G told HDC that Dr H did not discuss with him the decision to administer morphine elixir and clonazepam, but that had it been discussed, he would not have disagreed with it. Dr G also stated that in early 2015 the prescription of small doses of morphine elixir or clonazepam for patients with COPD was done quite routinely for patients at the public hospital to reduce the sensation of shortness of breath and to improve tolerance for BiPAP.

Mr A's deterioration and transfer to side room

31. At 6pm, RN D recorded that Mr A was "drowsy +++", that his SpO_2 was 72% and respiration rate 32 breaths per minute, and that the on-call house officer had been notified. At 6.20pm, RN D recorded that BiPAP was reinstated and that Mr A was administered back-to-back alternating saline and salbutamol nebulisers.[20]

32. The early warning score (EWS) chart stated that at 6pm Mr A's respiration rate was 32 breaths per minute and SpO_2 76%. At 6.10pm his SpO_2 was 71%, and at 6.20pm his respiration rate was 30 breaths per minute and SpO_2 77%. At 6.35pm, Mr A's respiration rate was 30 breaths per minute and his SpO_2 77% (see more detail on Dr H's review below).

33. The only entry made in the BiPAP observation chart for Saturday evening was at 6.30pm. When writing the BiPAP prescription details on the BiPAP observation chart, Dr I had specified an SpO_2 range of 88–92%.

34. RN C told HDC that her first contact with Mr A was when she relieved RN D for a meal break at approximately 6.30pm. RN C said that she first received training on BiPAP when she began working on the medical ward, and that subsequently she completed regular training updates. She stated that she has experience using BiPAP and various other oxygen therapy devices, and is "aware of the extra care required with oxygen therapy and COPD patients".

35. The care RN C provided to Mr A on Saturday is not documented in the clinical notes. She told HDC that when she walked into Mr A's room she noted that he had removed his BiPAP mask and was hypoxic with an SpO_2 of 71%. She stated that she attempted to calm him down and contacted the on-call house officer, who attended immediately.

36. At 7pm, Dr H recorded that he reviewed Mr A and that his SpO_2 had dropped to 71%. Dr H reduced the supplementary oxygen with no improvement, so he increased Mr A's oxygen to 6L/min. Mr A's SpO_2 levels then improved to 79–80%. Dr H noted that Mr A was conscious but very drowsy, that BiPAP was on, and that he had informed Mr B of his father's "sudden deterioration". Dr H also recorded:

[20] Salbutamol is used to treat acute asthma attacks.

> "[C]eiling of care documented but unlikely to benefit from further escalation. Side room if possible please. [Discussed with] registrar [Dr G]."

37. Dr H told HDC that he does not recall treating Mr A on Saturday, but he believes the clinical notes indicate that he informed Dr G and the night team of Mr A's deterioration appropriately. However, Dr H further told HDC:

> "I would also like to clarify that on [Saturday evening] when [Mr A] was moved to a side room that this was not for the initiation of comfort cares. In fact, after moving to the side room his BiPAP was reinitiated prior to the end of my shift. The reason for moving him into a side room was in anticipation that in restarting BiPAP he would require frequent assessments by nursing staff overnight. Being a general medical ward this would be very disturbing to the other patients in his initial room trying to sleep."

38. Dr G told HDC that he accepts that he should have contacted the on-call consultant that evening "for further advice on [Mr A's] management and to reconfirm or amend the previously established treatment plan". Dr G stated:

> "[When Dr H informed me of Mr A's deterioration] my thinking was that he was at his ceiling of care i.e. being on BiPAP. I had in mind that he was not for intubation or ventilation."

39. Dr G told HDC that he agreed with Dr H's suggestion to move Mr A to a side room:

> "to allow the other patients in the four bedded room to rest, because I was expecting [Mr A] to require a lot of attention from the medical and nursing staff overnight. My decision to move [Mr A] to a side room was not made with the intention of stopping active treatment or commencing end of life cares. In retrospect, due to my limited insight at that time into the complexities of managing BiPAP in patients with COPD, I did not consider moving [Mr A] to HDU for a better level of nursing and closer monitoring."

40. RN C told HDC that she and Dr H "moved [Mr A] into a side room as the impression was that he was deteriorating". RN C stated that she left Mr A's room once RN D had returned from her meal break.

41. There is no record in the clinical notes of the reason for the move.

42. At 7.35pm, Mr A's respiration rate was 32 breaths per minute and his SpO_2 78%. At 8.20pm, his respiration rate was 28 and SpO_2 83%. At 9.30pm, RN D recorded that Mr A's SpO_2 levels were 96–98%, that he was restless and agitated, and that she had contacted Dr H.

43. Dr H recorded that he reviewed Mr A at 9.25pm and instructed that BiPAP be continued overnight, with a plan to "wean oxygen down to lowest possible levels with [saturations of] 85–92%". Dr H noted: "If not tolerating BiPAP can trial removing it but aim for saturations of 85–92%."

44. At 9.30pm, RN D administered further clonazepam and recorded that Mr A had "settled + quietened with encouragement". She discontinued BiPAP (time not recorded) and noted that Mr A was "currently on mask 5L [oxygen]". RN D told HDC that Mr A's observations were taken hourly from 6pm until 10.15pm, and he was being checked frequently. She said: "I did not always document my formal observations findings." At 10.15pm, a graph line indicates that Mr A's SpO_2 was between 98–100%.

Overnight Saturday–Sunday

45. Overnight, RN E was responsible for Mr A. RN E received training on the use of BiPAP in 2012. She stated that she, along with other members of the nursing team, had 22 patients on the ward that night, and remembers that it was a "very busy" night. RN E stated that she was able to recall some points about the care she provided Mr A. She told HDC that when she started her shift at 11pm, Mr A was unresponsive, his SpO_2 was 95%, and he was wearing an oxygen delivery mask and receiving oxygen at 5/L per minute.

46. RN E said that she conducted observations immediately, reduced the oxygen delivery down to 2.5L/min via nasal prongs, and requested a medical review as she was aware of the risk of hypercapnia in patients with COPD. RN E also stated that she did not consider it safe to reintroduce BiPAP while she awaited a medical review, but she reviewed Mr A regularly. No observations were recorded for Mr A between 10.15pm and midnight.

47. At midnight, 1am and 2am on Sunday, Mr A's SpO_2 was charted via a line graph, which indicates that his saturation levels were between 96–100%.

48. At 2.10am, RN E recorded that Mr A had "settled during shift … not responding [to oxygen] — weaned off to 1.5L via mask, $SpO_2 > 95\%$". RN E told HDC that as Mr A was not responding to oxygen, she contacted Dr K, who was the on-call house officer that night.

49. Dr K reviewed Mr A and noted that he was "saturating at 98% on 3L via mask despite request to maintain [between] 85–92%". Dr K recorded that the oxygen was turned down to 1L/min and an arterial blood gas (ABG) test was performed, which showed that Mr A was severely hypercapnic[21] and acidotic.[22] Mr A's SpO_2 reduced to 95% on 1.5L/min via mask.

50. Dr K instructed that Mr A be recommenced on BiPAP and given salbutamol nebulisers. After about 20 minutes, Mr A became responsive to pain, followed by spontaneous eye opening. Dr K discussed the treatment plan with medical registrar Dr L. Dr K recorded: "[A]im O2 [saturations] between 85–90% (and no higher than 92%)" (emphasis in original).

[21] Hypercapnia is too much carbon dioxide in a person's bloodstream, usually as a result of not being able to get enough oxygen into the lungs.
[22] Acidosis is too much acid in the body, and occurs when a person's kidneys or lungs cannot keep the body's acidity levels balanced.

51. At 3.30am, RN E recorded that Mr A was recommenced on BiPAP and his SpO2 levels were dropping. She contacted Dr K, who advised her to adjust the BiPAP oxygen flow, which achieved an SpO2 of 85%. Mr A's SpO2 was 81% at 4am and 84% at 5am.

52. At 5.15am, Dr K reviewed Mr A again and noted that his SpO2 level had dropped to 71%. After some adjustment, Dr K raised Mr A's SpO2 to 88–90% and instructed the nursing staff to contact the on-call house officer "if any concerns". At 6am, RN E recorded that she was monitoring Mr A closely.

53. At 7am, Dr K reviewed Mr A and discussed the results of an ABG with Dr L. In consultation with Dr L, Dr K made a plan to continue Mr A on BiPAP "if tolerating", to maintain his SpO2 levels between 88–90%, and to contact a medical officer if Mr A deteriorated or if there were any other concerns.

Sunday

54. RN M was the nurse allocated to Mr A for the morning shift on Sunday. She has worked in the medical department at the public hospital since 2001, and has received periodic training and has experience with BiPAP.

55. On Sunday at 8am, RN M noted in the clinical record that Mr A's BiPAP was removed for breakfast, and that he was speaking in short sentences and appeared orientated, but was unable to remember much from the previous night. At 9.30am, it was recorded that Mr A became anxious and agitated, his SpO_2 dropped to 77%, and he was recommenced on BiPAP.

56. That morning, Dr G reviewed Mr A. Dr G did not document a time stamp but told HDC that he is "fairly certain" his review was shortly after 9.30am. He recorded that Mr A's SpO_2 was 80–90% and that he seemed settled on BiPAP and was not in distress. Dr G also documented that Mr A was "at [his] ceiling of care", and made a plan to keep him on BiPAP "as tolerated". Dr G directed that Mr A's SpO_2 levels be maintained between 85–90%, and that if his SpO_2 persistently dropped below 80%, he was to receive back-to-back nebulisers and be encouraged to cough.

57. Dr G told HDC that he reviewed Mr A on Saturday and Sunday in the morning or early afternoon. Dr G considers that at these times Mr A would have been at his best physical and mental condition. Dr G further stated:

> "This gave me false reassurance, especially on [Sunday], that [Mr A] was turning a corner. I did not consider the diurnal variation[23] and REM[24]/sleep related reduction and respiratory drive which is often seen in severe COPD. If I had had this knowledge at that time, I would have scheduled reviews later in the day and handed him for a night review on [Sunday]."

[23] Fluctuations that occur during the day.
[24] REM refers to rapid eye movement — one of the stages of sleep that people experience, and when dreams occur.

58. At 11am, Mr A's SpO_2 was recorded as 90%, and this is the last entry in the BiPAP observation chart. RN M told HDC that the BiPAP was removed at this time, but she could not recall the reason why it was removed. She recalled that Mr A was not tolerating it very well throughout the morning and appeared more settled without it. At 2.45pm, RN M recorded that Mr A had been fairly settled throughout the morning and "ha[d] not needed to return to BiPAP again". She noted that his SpO_2 varied from 77% when he was anxious to 87% on 2 L/min oxygen therapy when asleep, and that oral morphine was given with good effect. At 3pm, RN M recorded that she repositioned Mr A onto his side, and that he was "settled & sleeping".

Afternoon shift on Sunday

59. RN C worked the afternoon shift on Sunday. During her shift (no time stamp specified), RN C recorded that Mr A remained critically unwell, that his SpO_2 levels were "continuously monitored throughout the shift", and that he had desaturated to an SpO_2 of 60%. She also documented that Mr A was restless at times, and that he sustained a skin tear to his left leg and right knee when he tried to get out of bed. She noted that it took four staff "to contain" him, and that she gave him two drops of clonazepam "with good effect".

60. RN C also recorded that Mr A was "not tolerating BiPAP", that a non-rebreather mask[25] "worked well", and that she alternated the use of the mask with nasal prongs. She noted that Mr A's SpO_2 levels were maintained at +/– 92%, and that he required "constant close monitoring" as he kept removing his mask.

61. RN C further documented that Mr A opened his eyes "to voice but [was] largely incomprehensible" and was unable to swallow oral antibiotics. In light of this development she contacted the on-call house officer who reviewed Mr A at approximately 5pm and prescribed antibiotics intravenously.

62. At 3.30pm, RN C recorded on the observation chart that Mr A was asleep and that his SpO_2 was 91%, and indicated via a series of dots that his respiration rate was approximately 23 breaths per minute, temperature in the upper range of 36 degrees, and his pulse was approximately 85bpm. At 4.30pm, she recorded that Mr A was "on continuous [oxygen] monitoring" but did not document any observations.

63. At 7.30pm, RN C recorded that Mr A's respiration rate was 34 breaths per minute, SpO_2 92%, blood pressure 120/70mmHg, and pulse approximately 95bpm. At 9pm, she recorded that Mr A's respiration rate was 30 breaths per minute, SpO_2 92%, blood pressure 120/70mmHg, and pulse approximately 80bpm. At 10.40pm, RN C recorded that Mr A's SpO_2 was 91% on 3L of oxygen via a non-rebreather mask. RN C recorded that she administered clonazepam at 5.15pm, 7.15pm and 9.15pm.

64. RN C told HDC that she provided one-to-one care for Mr A for the majority of her shift, and that she was "acutely aware" that his SpO_2 levels should stay within the parameters advised by the medical team. She stated that her understanding was that

[25] A non-rebreather mask is a device to assist in the delivery of oxygen therapy. It requires that the patient can breathe unassisted and allows for the delivery of high concentrations of oxygen.

Mr A's SpO_2 levels should be kept between 85–90%, and that if they fell below 80% he was to be given back-to-back nebulisers.

65. RN C told HDC that there was "no formal decision" made by her or other nurses to discontinue BiPAP, and noted that Dr G had instructed in the medical notes early that day to continue BiPAP "as tolerated". She further stated:

> "I remember trying [Mr A] with the BiPAP machine at least twice during the shift, however he did not tolerate this and actively removed the mask after less than 5 minutes. I did not document these attempts however they were discussed with colleagues during the shift. I did use the non-rebreather mask with oxygen rates around 2–3L/min when his saturations dropped low, as this was in his room following an episode of acute drop the day before and he appeared to be able to tolerate this better than the BiPAP."

66. RN C said that she respected Mr A's right to refuse BiPAP therapy, and disagreed that she should have applied BiPAP "despite [Mr A's] objections", and noted that he "often removed even [the] nasal cannula" during her shift.

67. With respect to the maintenance of Mr A's SpO_2 levels, RN C said that Mr A was unstable and his SpO_2 fluctuated between 85–95% depending on whether he was settled and resting or exerting himself. RN C stated that she did not record all changes in his SpO_2 and oxygen flow delivery during the shift, but said that she was checking them regularly.

68. RN C said that when Mr A exerted himself or removed his oxygen device he became hypoxic and rapidly desaturated to an SpO_2 of 60% for short episodes. She told HDC that she responded "by changing oxygen delivery services and titrating oxygen up or down, and by administering Clonazepam, with [her] main aim being to reduce [Mr A's] distress".

69. RN C said that she noted that Dr G had recorded in the notes to contact a doctor if Mr A persistently desaturated below an SpO_2 of 80%, and to administer back-to-back nebulisers.

70. With respect to why she did not contact medical staff upon Mr A's desaturations, RN C stated:

> "I did not believe these short periods of desaturation, which responded to changes in oxygen, required me to contact medical staff as [Mr A] rapidly stabilised and his SpO_2 returned within requested parameters with the application of oxygen or titration of oxygen rate."

71. However, RN C said that she did contact the on-call house officer that afternoon to let the doctor know that Mr A was no longer able to tolerate his oral medications.

72. RN C stated that she administered salbutamol nebulisers at two-hourly intervals from 5pm. She told HDC that she did not "repeat the nebulisers constantly as [Mr A's]

desaturations and respiratory distress was intermittent and changed frequently", and she did not assess his status as requiring back-to-back nebulisers.

73. RN C further stated that she believed that the prescription of clonazepam was to relieve Mr A's distress and anxiety related to his end-stage respiratory failure, and that she did not link the use of clonazepam with supporting Mr A to tolerate BiPAP.

74. With respect to the frequency of her observations, RN C stated that the main observations she conducted were pulse oximetry[26] and assessing the effort Mr A was making in breathing, by watching his use of accessory muscles and his respiration rate. She told HDC that she minimised the times she took his blood pressure, as his arms were blistered and oedematous (swollen) and he became distressed when a cuff was applied. RN C further commented:

> "I did not document all observations (including respiratory rate) during the shift as my thinking was if 'no change' then it wasn't required. I was involved in directly delivering care and observing him throughout the shift."

Overnight Sunday/Monday

75. Overnight on Sunday/Monday Mr A's care was shared by RN N and RN F. RN N told HDC that he had received training in non-invasive ventilation and was the shift leader that night. He stated that Mr A's cares were provided by RN F, and he had little contact with Mr A. RN N said that the afternoon shift handed over that Mr A had not been tolerating BiPAP and so it had been stopped.

76. RN F told HDC that she has had no formal training on the use of BiPAP and cannot remember providing care to Mr A.

77. RN F recorded in the clinical notes: "[M]inimal intervention [overnight] as [patient] restless and wakeful. Slept most of the night … appears to be stable and comfortable this shift …"

78. RN F recorded observations for Mr A at 12am, 2am, 4am, and 6am. At 12am and 2am Mr A's respiration rate is recorded as being greater than 25 breaths per minute. At 4am his respiration rate was approximately 25 breaths per minute (these observations were plotted on a graph). RN F told HDC that she determined that two-hourly observations struck the right balance between patient safety and patient comfort.

Monday

79. At 10.45am, locum consultant Dr O reviewed Mr A. It was recorded during the review that Mr A was unconscious and "deteriorating", he had poor lung function and pneumonia, and he was "very unlikely to improve". Dr O discussed his plan to stop active treatment and transfer Mr A to comfort cares. It is recorded that Mr B agreed with the plan.

[26] Pulse oximetry is a test used to measure the oxygen level (oxygen saturation) of the blood. This information helps the healthcare provider to decide whether a person needs extra oxygen.

80. Dr G told HDC that he was the relieving registrar on Dr O's team that morning. Dr G said that before he and Dr O went into Mr A's room to review him, he (Dr G) told Dr O that Mr A had been unwell on Saturday but had "appeared to turn a corner" on Sunday. Dr G stated:

> "I was genuinely shocked when we walked into the room to find [Mr A] in an obtunded state, wearing a non-rebreather mask. I was very confused as to who ordered the non-rebreather mask and why I was not informed the previous evening of his deteriorating state. However at this point it seemed that [Mr A] was already dying, and so [Dr O] made the decision to put him on comfort cares."

81. At 12.12pm Dr I reviewed Mr A. It was recorded that Mr A had been unconscious "since last night" and had been on a rebreather "since yest[erday] afternoon" and was not on BiPAP. Dr I made a plan to do an ABG "and go from there". The results of the ABG test confirmed severe type 2 respiratory failure, and Dr I continued Dr O's management plan.

82. At 2pm RN D recorded that BiPAP had not been used during the morning shift and that Mr A was "now for comfort cares". She also recorded that there was "confusion about the medical team caring for this patient". RN D told HDC that she has no recollection of the care she provided to Mr A. Bay of Plenty District Health Board (BOPDHB) stated:

> "[RN D] was not immediately aware [Mr A] had been transferred from [Dr I's] care to [Dr O's] care at the Monday morning Medical Handover meeting. This information would have been available on the electronic patient management system."

83. Similarly, Dr I stated that at the morning meeting on Monday Mr A had been transferred to the general medicine team, which was led by Dr O. She said that this allocation occurred based on the fact that Mr A was located on the general medicine ward, which was not her base ward. Dr I told HDC that as she was the respiratory senior medical officer, and in light of Mr A's life-threatening respiratory issues:

> "I viewed it as more appropriate that [Mr A] continue under my care, rather than a general medical [senior medical officer] with other specialty interest; even if [Mr A] was not admitted on my base ward. Therefore, I saw [Mr A] on my ward round on [Monday]. As I was not aware of any deterioration in his condition, this was performed after I reviewed patients based in [two other wards]."

84. Sadly, at 2.50pm, Mr A died. At 5pm, Dr I recorded in the clinical notes that she had discussed Mr A's case with the Coroner "as BiPAP changed to oxygen therapy without change of plan by doctor (going from notes)". Dr I noted that no death certificate was to be written and the police were to be notified.

BOPDHB policies

85. BOPDHB's "Non-invasive ventilation — (NIV) — Bi-Level Positive Airway Pressure (BiPAP)/Continuous Positive Airway Pressure (CPAP) — nursing management policy" (NIV Policy) in force at the time of these events provides:

- Registered nurses caring for patients requiring BiPAP must have completed certification as per BOPDHB BiPAP/CPAP certification policy.
- All patients on BiPAP within the acute wards must be able to ring the call bell or summon staff; therefore, their GCS (Glasgow Coma Score) must be assessed and monitored.
- Contraindications to BiPAP include where a patient is unable to maintain his or her own airway, experiences a reduced level of consciousness such that he or she is unable to remove the mask or summon help (except in the ICU/HDU), experiences a hypersensitivity to mask material, hypotension, blood pressure becomes systolic < 90, bleeding from the nose, or the patient is uncooperative.
- Patients may have short rest periods from BiPAP as their condition indicates.
- If the patient deteriorates or is combative, the nurse must contact the doctor for urgent reassessment.
- Observations are required to be recorded on the EWS and BiPAP nursing checklist. EWS score, respiration effort, SpO_2, level of consciousness, oxygen flow rate, mask leak, IPAP[27] and EPAP[28] are to be recorded. Recordings are required to be made quarter hourly for one hour, then half hourly for two hours, then hourly for two hours, then two hourly when stable.
- Documentation is required to meet standards, and is essential to monitor progress of patients needing NIV.

86. In one part of the NIV policy it recommended starting BiPAP therapy with pressures of IPAP 8cm and EPAP 4cm, and later it recommended starting pressures of IPAP 12cm and EPAP 4cm.

87. BOPDHB's "Oxygen delivery systems and guidelines for adult use" (Oxygen guidelines) in force at the time of these events stated that standard oxygen masks and non-rebreather masks should be used on patients without COPD, and that Venturi[29] masks should be used for patients with COPD with a history of carbon dioxide retention. The guidelines state that nasal prongs should be used for patients who require less than 5L/min of oxygen to reverse hypoxaemia.[30] The protocol contains no guidelines or cautions about the use of high flow oxygen in patients at risk of hypercapnic respiratory failure.

[27] Inspiratory positive airway pressure.
[28] Expiratory positive airway pressure.
[29] A Venturi mask is a type of oxygen mask used to deliver controlled oxygen concentration to a patient. The mask mixes oxygen with room air, creating high flow enriched oxygen.
[30] Abnormally low levels of oxygen in the blood.

88. BOPDHB's "Medical responsibility for patient care — delegated responsibility of RMOs — when to call a consultant on call" policy (Supervision policy) in force at the time of these events stated that ultimately the consultant on call is responsible for the patients admitted under his or her care, and should be kept reasonably informed regarding their condition. The policy states that in general the consultant should be contacted by a registrar, and house officers should seek the assistance of the relevant registrar. If the registrar is not available, the house officer should contact the consultant.

89. The Supervision policy states that if the responsible consultant is not available, or not on call, then the on-call consultant for that speciality "MUST" (emphasis in original) be contacted in a number of circumstances, including:

- If a patient is seriously ill or is sufficiently ill to require admission to ICU or HDU.
- Any patient in whom the diagnosis or management is unclear, and for whom delay of management until the next ward round would be inappropriate.
- Any patient who deteriorates or dies unexpectedly.

90. The Supervision policy also states that if a patient is transferred from the care of one responsible specialist to another, it is imperative that communication occurs between the two teams before the transfer of care. The transfer of care and record of communication must be documented in the patient's health record by the team doing the transfer.

Further information from BOPDHB

91. Following Mr A's death, BOPDHB undertook a number of actions.

Dr I's reports and meeting with Mr B

92. On Monday, Dr I wrote a report in BOPDHB's quality control management system. Under the findings section of her report she stated that the key concerns expressed by the medical team were that BiPAP therapy was removed by nursing staff "with no notification of [the] on-call medical team", and that a non-rebreather mask was selected to provide oxygen for a patient with clinical evidence of carbon dioxide retention. Dr I stated that this "highlights wider issues of non-prescribing of oxygen therapy delivery devices and nursing knowledge of the differences in oxygen delivery services".

93. Following these events, Dr I wrote to the Coroner and provided a summary of the care provided to Mr A. In that letter she stated that she and the other doctors caring for Mr A were "not aware that BiPAP was removed and not restarted" by the nursing staff.

94. Dr I also wrote a letter to Mr B in response to the concerns he raised with BOPDHB. In that letter she stated that she was not informed of Mr A's deterioration "despite being your father's physician", as she was not on call for the weekend of Mr A's admission. On 9 April 2015, Dr I, along with other members of BOPDHB's management team, including the Nurse Leader for Medical Services, RN R, and the Medical Leader for Medical Services, Dr P, met with Mr B to discuss his concerns

regarding the care his father received. In that meeting, Dr P stated that if the registrars caring for Mr A had "had senior support they would have picked up on some of the nuances that were missed" regarding Mr A's presentation. With respect to the nursing care provided, RN R stated: "[T]here was a lack of escalation from the nursing staff when there was a deterioration" in Mr A's condition.

BOPDHB investigation report

95. BOPDHB also conducted an internal investigation into the care Mr A received. The investigation report (the report) found that over the course of the afternoon shift on Saturday and night shift on Saturday/Sunday, "the focus of care moved towards maintaining [Mr A's] comfort, e.g. initiation of morphine and clonazepam". The report stated that while "issues with tolerance of BiPAP" were documented, "no plan was made to discontinue BiPAP", and that the doses of morphine and clonazepam Mr A received on Saturday "may have contributed to his [carbon dioxide] retention … and was a possible contributor to the perception that he was more settled i.e. [a] decreased level of consciousness due to hypercapnia (increased amount of carbon dioxide)".

96. The report stated that the transition from the use of BiPAP to it not being reapplied "appears to have occurred over the morning/afternoon shift on Sunday — with the last BiPAP observations being at 11.00am". It also noted that "within the nursing reports it appears that there is a misunderstanding around how [a] rebreather mask functions", and that RN C "expressed regret" at not informing the on-call house officer of Mr A's decreased tolerance of BiPAP, but that "at the time she believed that she was following [the] plan of care to maintain [SpO_2 saturation levels] between the ordered range using escalating nebulisers, oxygen and BiPAP if necessary".

97. The report stated that over the course of the Saturday and Sunday evening shifts:

> "[Mr A required] almost 1:1 care and it may have been useful to notify both the duty manager and the [on-call house officer] to consider transfer to HDU for a higher level of care. Given occupancy earlier in the week this may not have been feasible however it would have reinforced [Mr A's] condition as being unstable and potentially escalated the review process and support for the nursing staff on the ward."

98. The report recommended that BOPDHB undertake a number of actions, including:

- Removing BiPAP from use in general medical wards and establishing a dedicated area on the medical floor for BiPAP and NIPPV[31] use.
- Expanding BiPAP/CPAP[32] order forms to include goals of treatment and oxygen delivery system orders.
- Considering reintroduction of low flow oxygen delivery systems, including Venturi masks, on the medical wards.

[31] Nasal intermittent positive ventilation.
[32] Continuous positive airway pressure.

- Commencing routine medical review of patients on BiPAP "as a matter of course", and for it to be part of the handover between outgoing and oncoming medical shifts.
- Developing an oxygen fact sheet to accompany the oxygen protocol.
- Reviewing the process for nebuliser use when a patient is on BiPAP.

RN R's report

RN R stated that upon review of the nursing care provided to Mr A, she identified the following issues:

- There was "a deficit within organisational protocols namely information around the types of delivery services available and guidelines for selection of appropriate devices".
- The use of non-rebreather masks in the context of a patient with a history of carbon dioxide retention and COPD "appears to have been a poor selection" and "should only have been a short term strategy and not kept as an oxygen delivery option for a patient with a history of CO_2 retention".
- There was a failure to document oxygen delivery devices clearly and flow rates consistently, and there was a lack of standardised recordings of SpO_2 levels. RN R noted that for patients with low tolerance for inhaled oxygen, plotting a graph for SpO_2 levels "does not provide an accurate measurement".
- The early warning score (EWS) chart did not provide a space to indicate which oxygen delivery device was being utilised.
- There was no prescription for the oxygen delivery device on the medication chart.
- In 2015, the BiPAP care pathway recommended that patients requiring BiPAP were not to be prescribed sedation; however, there were regular instances of the use of clonazepam to relieve patient anxiety and distress.
- The fact that a ceiling of intervention form was instituted, and that Mr A had a poor prognosis and was transferred to a side room, resulted in staff interpreting Mr A's care to "be focused on maintaining comfort (rather than reversal of his acute chronic respiratory failure)".

Dr P's report

99. Dr P told HDC that Mr A's case was discussed extensively at a departmental Morbidity and Mortality meeting, and there has been follow-up discussion on a number of the concerns raised subsequently.

100. Dr P stated that, although the use of sedatives to improve the tolerability of BiPAP is accepted practice, BOPDHB was concerned that a sedative was prescribed by a house officer (Dr H) without discussion with a more senior doctor, and that the documentation failed to clarify the intent of its use, which led to confusion amongst nursing and medical staff as to the nature and intent of the treatment. She stated:

> "There was a lack of understanding that [Mr A] remained for full active treatment of curative intent and a belief by some staff that his treatment was purely palliative."

101. Dr P further stated that there was a consensus of agreement amongst senior staff that they would have wanted to be contacted in situations like Mr A's — when a patient was deteriorating despite the current management. She stated:

> "Junior staff are consistently reminded and reassured of the support available at all hours from senior staff and [they] work hard to maintain a relationship with staff that makes asking for help acceptable and in no way intimidating."

102. Dr P expressed concern regarding "poor documentation of clinical reviews and actions", and stated that "poor instruction on oxygen delivery" was provided to nursing staff. Dr P also stated that the service felt that it was inappropriate that patients such as Mr A could be looked after across a wide range of settings and by staff with a wide variety of experience and training.

SMO supervision and medical handover

103. BOPDHB explained that Mr A was under the care of Dr I from the time he was transferred to the ward on Friday until he was transferred to Dr O's care on Monday morning (more details above). BOPDHB told HDC that as Dr I was not on duty over the weekend, all medical patients, including Mr A, were covered by the consultant on call. The senior medical officer on call on Saturday was Dr Q. He had no involvement in Mr A's care. The senior medical officer on call on Sunday was Dr O. Dr O was not contacted by junior medical staff on Sunday. As stated, he first reviewed Mr A on Monday morning.

104. With respect to formal handover of patients, BOPDHB stated that each morning a medical handover meeting is held at 8am and attended by all available senior medical officers in the medical services department, junior doctors (including registrars and house officers) and senior nursing representatives from the APU and medical wards. At these meetings all new patients, patients who have transferred or are ready for transfer from APU to the medical wards, and any patients considered at risk, are discussed. Patients are also reallocated physicians based on the ward in which they are staying.

105. As well as the morning medical handover, junior medical staff individually hand over information to their oncoming colleague between shifts. In the evenings, junior on-call medical and surgical staff, the ED senior medical officer or the ED co-ordinator, and nursing duty managers meet between 9–10pm, to discuss the current state of ED, APU and the medical wards, any patients at risk, or patients who require multi-speciality review.

BiPAP training

106. With respect to the level of BiPAP training nursing staff had at the time of these events, RN R told HDC that care of patients requiring oxygen therapy "is a core nursing skill which is taught in undergraduate programmes and then followed up

during orientation induction (both at nursing entrance to practice and as a core competency during orientation)". She further commented:

> "BiPAP education has been delivered for at least 10 years for nursing staff working across the medical floor (and in the Admission Planning Unit). Both [RN C] and [RN D] had completed certification in the care requirements for patients receiving BiPAP. The expectation was that all RNs working across the acute medical service would undertake training and certification as part of their first year's employment within the service — this will however change with the move for use of BiPAP being limited to APU or [the respiratory ward]."

Changes to practice

107. BOPDHB stated that patients on NIV, patients in the HDU, or patients with complex medical situations, now have daily mandated medical reviews of their management plans. BOPDHB also stated that two senior medical officers are rostered on over the weekend to facilitate more inpatient reviews for patients in the medical wards.

108. With respect to handover of BiPAP patients, BOPDHB told HDC that formal morning, evening, and after-hours handover processes have been instituted, and include the presentation of all at-risk patients. Patients on BiPAP or NIPPV are handed over for review at the meetings, "including [senior medical officer] review at the weekends and/or as necessary". BOPDHB also stated that "where possible" patients presenting with respiratory failure are cared for by one of the respiratory physicians on staff, but that this is not always achieved owing to capacity constraints, including when other senior medical officers are on leave.

109. BOPDHB also stated that it has "reduced the variation in BiPAP machines" across the medical service, with older machines being disposed of, and that it has also updated the BiPAP protocol and BiPAP/CPAP order form and is piloting a new BiPAP care pathway. BOPDHB further stated that low flow oxygen delivery systems are available across the medical wards, but noted that "there is a clear move by the respiratory physicians towards using humidification for patients with acute or chronic airway disease and failure".

110. BOPDHB told HDC that patients who require BiPAP are now treated in ED or APU initially, and then either transferred to the HDU or the respiratory ward. The DHB stated that this change will allow training to be maintained at a consistent standard for those providing BiPAP treatment, and "also facilitates communication of concerns up the medical hierarchy".

111. BOPDHB stated that all medical staff in the medical services department have received education regarding the use of sedatives for patients on NIV, and alternative measures that can be used to improve tolerability of the treatment. BOPDHB also told HDC that all prescriptions of sedatives for patients on NIV "must now be discussed with a more senior doctor, at least a registrar, but given all such patients have mandated daily review by a consultant (including weekends and holidays), this discussion often occurs with or is rapidly reviewed by [a senior medical officer]".

112. BOPDHB stated that it has developed a resource tool that provides information regarding the types of oxygen delivery devices available and guidelines for selection of appropriate devices. The resource tool is available across acute inpatient areas, and is to be linked with oxygen delivery protocols available on BOPDHB's internal intranet system.

113. BOPDHB told HDC that nursing staff have received training on the use of nebulisers (including air-generated nebulisation), and that education on oxygen device selection and the new oxygen delivery resource tool has been added to the "organisational training calendar".

Further information from RN D

114. With respect to changes to practice, RN D told HDC that when a patient is handed over to her she ensures that she has a "concise understanding of any specifics relating to the patient". She also stated that her clinical documentation "has improved significantly" and she now ensures that she completes more frequent observations, which adhere to EWS guidelines specified on the observation charts, and documents events as they occur. RN D further stated that she promptly contacts the medical team and nurse leader or the after-hours support supervisor when a deterioration in a patient's condition is observed. When a patient is admitted, she assesses whether a respiratory nurse specialist should be consulted.

Further information from RN C

115. RN C stated that following these events she completed further training on the use of BiPAP to ensure that her practice "is [in] line with current education". With respect to changes to her practice, RN C stated that if faced with a case like Mr A's again, she would "request a more formal medical review to clarify the aims of both the medical and nursing care in light of the ongoing deterioration". She also stated that she now ensures that she has access to the appropriate oxygen delivery devices (including Venturi masks) to ensure a better control of the delivery of oxygen rate, and she reviews the clinical notes to identify any risks to the patient.

Further information from Dr H

116. Dr H told HDC that he felt that Mr A was cared for "in an area that was ill suited to the very intensive needs he required". Dr H further stated:

> "At that time there was not an area designated for patients on BiPAP. BiPAP requires nurses that are both familiar with its use and able to spend prolonged periods of time with the patient. The most suitable place for a patient with BiPAP is in a high dependency unit where one to two nursing care is available. [Mr A] was managed on a general medical ward where the nurse caring for him [had] minimal experience and also had at least 4 other patients they were looking after."

117. Dr H stated that the changes BOPDHB has implemented to its practice, including BiPAP patients being reviewed daily by medical staff, will "help to prevent many of the issues seen in [Mr A's] care".

Further information from Dr G

118. Dr G stated that at the time of Mr A's admission he was in his first month as a registrar and "still adjusting to the increased responsibility that the role entailed". He also stated that he was on a relief run and, whilst he was allocated a senior medical officer as a run supervisor, he did not have much clinical contact with the senior medical officer because usually he was relieving other teams. Dr G further commented:

> "I was also affected by the attitude among certain registrars in the department that registrars should be competent and self-sufficient, hence able to 'handle' problems without always involving the consultant. In my anxiety to perform well in the role, I tried to assume too much responsibility and overlooked my lack of experience in the role of a medical registrar.
>
> Now that I have more experience in this role and had time to reflect, I know that the above attitude is unhelpful, and so I have completely changed my practice and made it a routine to involve consultants in difficult decisions, especially concerning unwell patients, like [Mr A]."

119. Dr G further stated that of the three registrars rostered on duty for the weekend, he felt he was given "the most demanding role of performing ward reviews, discharges and holding the on-call phone", and that his ward reviews were "constantly interrupted by calls from ED and GPs". Dr G stated that he remembers feeling stressed and overwhelmed, "and this was a significant contributing factor to the lack of thoroughness of [his] documentation in Mr A's notes". Dr G stated that the medical department "has since vastly improved the workload of the registrars on the weekend by allocating a second [senior medical officer] to help with the more difficult ward reviews and discharges".

120. With respect to Mr A's SpO_2 levels, Dr G stated that he is aware that the standard range of SpO_2 advised for patients with exacerbations of COPD is 88–92%. He told HDC that he specified Mr A's target SpO_2 as 85–90% during the weekend because he knew that Mr A had very severe COPD and noticed on the observation chart on Friday and Saturday that Mr A had exceeded an SpO_2 of 92% on two occasions despite being given only low-flow oxygen of 1L/minute. Dr G said that he thought that a slightly lower upper limit of 90% "would have been safer to prevent CO_2 retention, which would also prevent confusion or drowsiness and thus improve tolerance of BiPAP".

121. Dr G further stated that he did not define specific parameters regarding how to manage Mr A on BiPAP because he agreed with the parameters already set by Dr I on Thursday, and did not want to make any changes to them.[33]

[33] On Thursday, Dr I made a plan to keep Mr A on BiPAP with breaks for eating and drinking, and specified an SpO_2 range between 88–92%. On Friday, Dr I made a plan to encourage the use of BiPAP "for as long as possible" that day.

122. Dr G also said that at the time of these events he had had previous experience using BiPAP, but, having had time to reflect, "I realise that my experience at that time was limited to patients with less severe COPD exacerbations who rapidly improved with treatment." Dr G said that he failed to consider the complexities of the use of the BiPAP and when managing patients on BiPAP, and that he now documents more closely the following:

- Time to remain on BiPAP
- Pressure parameters
- Duration of breaks allowed
- Fraction of inspired oxygen/oxygen flow rate
- Nurses are to inform him or the house officer if BiPAP is not tolerated.

123. Dr G said that he did not specify the oxygen delivery device to use if Mr A was not able to tolerate BiPAP. Dr G stated that his expectation was that all acute medical nurses would have undergone appropriate training to manage patients requiring BiPAP, and also would have been trained to use only low-flow and controlled oxygen delivery devices in such patients to avoid hypercapnia. Dr G stated:

> "Having only worked in [the public hospital] for a month at that time, I had no reason to question the training of nursing staff. I was not aware at the time that nurses managing BiPAP did not have the required knowledge on the reason saturations are kept within a tight range in patients with COPD exacerbations."

124. Dr G stated that, in retrospect, he considers that a controlled oxygen delivery device such as a Venturi mask should have been prescribed, and he now makes it routine practice to prescribe the oxygen device he would like to be used.

125. With respect to changes to his practice, Dr G stated that he now has a much lower threshold for consulting senior medical officers, and is better able to recognise his areas of weakness and when to ask for help. He also stated that he is more careful in prescribing opiates/benzodiazepines in patients with COPD or who are on NIV, and has been reminded of the importance of detailed documentation in the clinical notes and "especially to include the date, time, my full name and contact details in all entries".

126. Dr G stated that he has also learned the importance of clear communication on the specifics of BiPAP management, and now explicitly instructs nursing staff to contact him if they have concerns, "instead of assuming or hoping that they will do so". Dr G stated that he also developed strategies to reduce stress at work.

Responses to provisional opinion

127. The parties were given an opportunity to comment on the relevant sections of the provisional report. These responses have been incorporated into the report where appropriate. Further responses have been outlined below.

The family

128. Mr B stated that the family did not wish to comment on the provisional decision.

BOPDHB

129. The DHB stated that BOPDHB did not wish to comment on the provisional decision.

Dr G

130. Dr G stated that he accepted the findings of the provisional decision.

RN C

131. RN C stated that she did not wish to comment on the provisional decision.

RN D

132. RN D stated that she did not wish to comment on the provisional decision.

Opinion: Introduction

133. This opinion considers the standard of care that Mr A received during his stay at the public hospital in 2015. It is not my role to make findings of causation. Accordingly, this opinion should not be interpreted as having any implication as to the cause of Mr A's death.

Opinion: Bay of Plenty District Health Board — breach

Introduction

134. During Mr A's admission to the public hospital between Thursday and Monday, the care he received from a number of clinicians was suboptimal. Individual BOPDHB clinicians who provided services to Mr A hold a degree of responsibility for the suboptimal care at various times. However, as stated in previous opinions of this Office,[34] district health boards are responsible for the operation of the clinical services they provide, and can be held responsible for any service failures.

135. BOPDHB had an organisational duty to ensure that services were provided to Mr A with reasonable care and skill. Taking into account the number of BOPDHB clinical staff involved in Mr A's suboptimal treatment, I consider that BOPDHB holds primary responsibility at a systems level for the poor standard of care provided.

Initial assessment

136. My expert advisor, Dr Conroy Wong, advised that Mr A's initial assessment and management in the ED was of a high standard and did not depart from accepted practice. In addition, Dr Wong advised that the transfer to the APU rather than the HDU was in line with accepted practice, as the HDU was full. Dr Wong advised that even if the HDU had not been full, it is unusual for patients with very severe COPD to

[34] Opinions 10HDC00703, 10HDC00419, 14HDC00766, available at www.hdc.org.nz.

be transferred to an HDU because of the limited resources and poor prognostic outlook for these patients. I accept that Mr A's initial assessment and management was of an appropriate standard.

Ward location

137. Dr Wong advised that NIV of patients with severe COPD who have an acute exacerbation is a very difficult management issue, which requires high-level knowledge, skill, and experience combined with a coordinated team that communicates the management issues and plan clearly. Dr Wong stated that ideally patients should be managed in a dedicated ward with skilled staff and oversight and regular review by a respiratory consultant.

138. Dr P agreed that it was inappropriate that patients such as Mr A could be looked after across a wide range of settings and by staff with a wide variety of experience and training.

139. BOPDHB told HDC that patients requiring BiPAP are now treated in ED or APU initially, and then transferred to either the HDU or the respiratory ward. The DHB stated that this change will allow training to be maintained at a consistent standard for those providing BiPAP treatment, and will facilitate communication of concerns up the medical hierarchy.

140. In my view, such changes are likely to improve the services provided to patients such as Mr A.

Oxygen delivery and NIV protocols

141. The oxygen delivery protocol current at the time of these events contained no guidelines or cautions about the use of high flow oxygen in patients at risk of hypercapnic respiratory failure. Dr Wong advised me that the protocol was inadequate as an independent document for guiding oxygen therapy, but provided useful background information on the different delivery systems.

142. The NIV protocol current at the time of these events described the ventilation process and had a checklist for assessing suitability of treatment for patients with COPD. However, Dr Wong advised that there were conflicting statements about starting pressures, in that in one part it recommends starting pressures of IPAP 8cm and EPAP 4cm, which gives an IPAP starting pressure that is inappropriately low for most patients, and later it recommends starting pressures of IPAP 12cm and EPAP 4cm. I am critical of the inconsistency of this information in light of the confusion it could cause.

143. However, I also note that during the course of this investigation BOPDHB developed a resource tool that provides information regarding the types of oxygen delivery devices available and guidelines for selection of appropriate devices. Upon reviewing the steps taken by BOPDHB, Dr Wong advised that the deficiencies he identified in the oxygen delivery and NIV protocols have been corrected.

Management of BiPAP and oxygen therapy

144. The communication of the plans and requirements for use of the BiPAP were, at times, ambiguous. Dr G's plan on Saturday was to maintain the SpO_2 at 85–90%, and if Mr A's SpO_2 was "persistently" less than 85% he was to be put back on BiPAP.

145. Dr H's plan on Saturday was to continue the BiPAP overnight, but if Mr A was unable to tolerate it, it could be removed with the aim of maintaining his oxygen saturations between 85–92%.

146. RN C said that on Sunday afternoon Mr A became hypoxic with short drops in his SpO_2, which were managed by increasing his oxygen rate, changing the oxygen delivery device, repositioning him, and reassuring him.

147. RN C stated that the registrar had documented a request to contact him for review if Mr A "persistently" desaturated below 80%, but she considered that Mr A did not persistently desaturate below 80%, and his episodes of desaturation were short in duration.

148. Other nursing staff also removed Mr A's BiPAP from time to time. RN Carey advised me that it was reasonable to do so, as typically patients struggle with NIV, and the need for short breaks in therapy is not uncommon. RN Carey stated that all situations where nursing staff are struggling to maintain a patient on BiPAP or reintroduce it after a short break should be communicated promptly to a medical officer. However, that did not happen.

149. RN Carey advised that there was a significant failure by nursing staff to appreciate that Mr A was prescribed BiPAP because of his hypercapnic respiratory failure. She was "unsure whether this was in part due to a lack of respiratory knowledge or not". However, RN Carey noted that the medical message that the BiPAP should be used if/as tolerated was a mitigating factor. Similarly, Dr Wong noted that it appears that the nurses were left to judge when Mr A should or should not have BiPAP.

150. In my view, the instructions to the nursing staff about Mr A's BiPAP therapy should have been clearer and, in particular, the nursing staff should have been aware of the reason why Mr A had been prescribed BiPAP, and the circumstances in which a medical review was indicated.

151. I note that both the BOPDHB review by Dr I, and RN R, questioned the treatment of Mr A with a non-rebreathing mask. This is supported by my expert, Dr Wong, who advised that a non-rebreathing mask was used to deliver very high concentrations of oxygen, which is not appropriate for patients who have COPD and hypercapnic respiratory failure.

152. In addition, RN Carey advised me that there were periods when the nursing care provided overnight was inconsistent with the expected care of a COPD patient with Type 2 respiratory failure. In particular, she was critical that Mr A continued to be administered oxygen therapy despite his SpO_2 being higher than the required upper

limit specified by the medical team, for instance, on Saturday afternoon/evening, overnight on Saturday/Sunday, and on Sunday afternoon.

153. Therefore, I am also critical that Mr A was not treated with the appropriate oxygen delivery apparatus, and that staff administered oxygen therapy when Mr A's SpO_2 levels were higher than the upper limit prescribed by the medical team.

Consultation between BOPDHB staff

154. There were a number of occasions on which nursing staff failed to consult with the medical team and/or seek a medical review, and I am critical of the nursing staff for this failure. For example, over two shifts on Saturday and on the Sunday morning shift, nurses discontinued BiPAP therapy without seeking medical review. Overnight on Sunday/Monday, BiPAP therapy was not used, and the medical team was not aware that BiPAP had been removed and not restarted.

155. Also during this shift, the medical team were not alerted, nor were hourly observations commenced, when Mr A's respiration rates were recorded as being greater than 25 breaths per minute and Mr A was restless. RN Carey advised me that in accordance with the adult observation chart, Mr A's respiratory rate should have triggered the nursing team to contact the medical team and request a review.

156. There were also occasions where medical staff made decisions without consultation with more senior staff. On Saturday, Dr H prescribed clonazepam and morphine elixir PRN (as needed) without first consulting Dr G. When Mr A deteriorated that day, Dr G did not consult the on-call consultant.

157. Dr Wong advised me that Dr H's decision to prescribe sedation without consultation with a registrar, and his failure to record in the notes an assessment of Mr A's acute deterioration, were a deviation from accepted practice. However, Dr Wong advised that the use of sedation in patients with hypercapnic respiratory failure is an accepted practice, and the doses given were not excessive. I am critical that Dr H did not consult the registrar prior to prescribing sedation to Mr A, or document this adequately.

158. As mentioned above, Dr G did not contact the on-call consultant when Mr A deteriorated. Dr G stated that the attitude among certain registrars in the department was that registrars should be competent and self-sufficient and able to handle problems without always involving a consultant. However, Dr P said that there was a consensus of agreement amongst BOPDHB senior staff that they would have wanted to be contacted if a patient was deteriorating despite the current management. She stated:

> "Junior staff are consistently reminded and reassured of the support available at all hours from senior staff and work hard to maintain a relationship with staff that makes asking for help acceptable and in no way intimidating."

159. In my view, it is important that junior staff are encouraged and supported to have a low threshold to seek senior support, and BOPDHB should continue to develop a

culture that encourages this. I am concerned that Dr G felt that there was an attitude amongst some registrars that they should, where possible, avoid escalating matters to senior staff.

160. Dr Wong advised:

> "Overall, the lack of clear [senior medical officer] oversight of the management of this patient during the weekend meant that definitive decisions about BiPAP treatment and changing the management to palliative care were not made."

161. In my view, there was suboptimal communication between the nursing team and medical staff responsible for caring for Mr A, and between junior and senior members of the medical team.

Conclusion

162. District health boards are responsible for the operation of the clinical services they provide, and can be held responsible for any service failures. In my view, it was the responsibility of BOPDHB to have adequate systems in place and appropriate oversight of staff to ensure that Mr A received an acceptable level of care. I consider the failures of the clinical staff to be service failures that are directly attributable to BOPDHB as a service provider. In my view, BOPDHB provided Mr A with suboptimal care as follows:

- The oxygen delivery systems utilised were inappropriate for a patient with hypercapnic respiratory failure, and Mr A was administered oxygen therapy despite his SpO_2 levels being higher than the upper limit prescribed by the medical team.
- The oxygen delivery protocol contained no guidelines or cautions about the use of high flow oxygen in patients at risk of hypercapnic respiratory failure, and the NIV protocol had conflicting information about starting pressures.
- Nursing staff failed to appreciate that Mr A was prescribed BiPAP because of his hypercapnic respiratory failure.
- The management plan for the use of the BiPAP was not communicated to the nurses effectively.
- Nursing staff did not inform the medical team when they struggled to maintain Mr A on BiPAP, or when Mr A's observations indicated the need for a medical review.
- Medical staff made decisions without consultation with more senior staff, and did not seek senior medical input when indicated.

163. Cumulatively, these issues amount to a failure to provide services to Mr A with reasonable care and skill. Accordingly, Bay of Plenty District Health Board breached Right 4(1) of the Code.

Opinion: RN D — breach

164. RN D cared for Mr A during the afternoon shift on Saturday and also during the morning shift on Monday.

165. On Saturday afternoon, Mr A became short of breath following a transfer to the bathroom without oxygen. RN D does not recall taking Mr A to the bathroom without oxygen. She told HDC that her usual practice is to be aware of, and conscientious about, the necessity for oxygen when transferring a patient.

166. I am unable to make a finding as to whether RN D was involved in mobilising Mr A without oxygen. However, I note the advice of my expert nursing advisor, RN Dawn Carey, that if RN D had mobilised Mr A without oxygen, she (RN Carey) would be critical of that action and consider it "a worrisome practice for an RN experienced in medical care nursing".

167. I also note RN Carey's advice that Mr A's respiration rate at 4.30pm should have triggered hourly monitoring. RN D did not monitor Mr A until 6pm, and I am critical of that delay.

168. Mr A was administered oxygen therapy by mask until 6.20pm, when BiPAP was reinstated. Mr A's BiPAP was later discontinued (time not recorded) and he was administered oxygen by mask at 5L/min. The adult observation chart indicates that at 4.30pm Mr A's SpO_2 was 94%, at 9.30pm it was 98%, and at 10.50pm a graph line indicates that it was 98–100%. These SpO_2 levels were above the range Dr G specified (85–90%) during his review of Mr A that morning.

169. RN Carey stated: "I disagree with [Mr A] being administered oxygen therapy and his oxygen saturations being higher than the required upper limit."

170. Dr H reviewed Mr A at 9.25pm and instructed that BiPAP be continued overnight. RN D discontinued the BiPAP some time after that review.

171. RN Carey advised me that it was reasonable to remove Mr A's BiPAP for short periods of time. However, the decision to discontinue/pause the BiPAP therapy should have involved clinical decision-making, and should have been informed by the reason for the BiPAP in the first place and Mr A's status.

172. RN Carey said that if a patient is unable to tolerate NIV, typically the patient becomes agitated. She advised that the agitated behaviour could be because the patient is struggling within the confines of a tight face mask, but it could also be indicative of hypoxaemia or worsening hypercapnia, which could be determined objectively only through ABG analysis. RN Carey advised:

> "I would expect that all situations where ward nursing staff are struggling to maintain a patient on BiPAP or reintroduce it after a short break, are promptly communicated to a medical officer."

173. RN Carey said that there was a significant lack of critical thinking behind the decision to cease Mr A's BiPAP therapy. She advised that the nursing care RN D provided to Mr A over the course of this shift moderately departed from accepted standards.

174. It is concerning that RN D did not follow the documented plan with regard to the SpO_2 levels. I am also concerned that RN D was not aware that clonazepam had been prescribed to Mr A to support him to tolerate the BiPAP, and did not seek medical review when she was unable to maintain Mr A on BiPAP, and instead discontinued the BiPAP despite the doctor's advice.

175. Overall, I consider that RN D did not provide services to Mr A with reasonable care and skill and, accordingly, breached Right 4(1) of the Code.

Opinion: RN C — breach

176. RN C stated that she first provided care to Mr A on Saturday evening, when she relieved RN D for a meal break at approximately 6.30pm. RN C told HDC that during this time she and Dr H moved Mr A into a side room following his deterioration. The care she provided on Saturday is not documented in the clinical notes.

177. On Sunday morning, Dr G reviewed Mr A. He instructed that Mr A's SpO_2 levels were to be maintained between 85–90%, and that he be continued on BiPAP "as tolerated". Dr G also instructed that if Mr A's SpO_2 levels persistently dropped below 80% he was to receive back-to-back nebulisers and be encouraged to cough.

178. RN C worked the Sunday afternoon shift. She recorded in the clinical notes that Mr A remained critically unwell, was restless at times, and had desaturated to an SpO_2 of 60%. She recorded that it took four staff to contain him, and that clonazepam was given with good effect.

179. RN C recorded that Mr A was "not tolerating BiPAP", and instead she used a non-rebreather mask alternated with nasal prongs. She noted that Mr A's SpO_2 levels were maintained at +/– 92%, and that he required constant close monitoring as he kept removing his mask. At 7.30pm RN C recorded that Mr A's respiration rate was 34 breaths per minute and SpO_2 92%. At 9pm she recorded that his respiration rate was 30 breaths per minute and SpO_2 92%. She also recorded that she administered clonazepam at 5.15pm, 7.15pm, and 9.15pm.

180. Throughout this shift, Mr A did not receive BiPAP therapy. RN C told HDC that there was "no formal decision" made by her to discontinue BiPAP, and noted that Dr G had instructed in the medical notes earlier that day to continue with BiPAP "as tolerated". She stated that she attempted to commence Mr A on BiBAP at least twice during the shift, but he actively removed the mask.

181. RN C stated that when Mr A exerted himself or removed his oxygen device he became hypoxic and rapidly desaturated to SpO_2 60% for short episodes. RN C said

that she did not contact medical staff upon Mr A's oxygen desaturations, as his SpO_2 levels rapidly stabilised with the application of oxygen or titration of oxygen flow rates. RN C also stated that she did not repeat nebulisers constantly, as Mr A's saturations and respiratory distress were intermittent and changed frequently.

182. RN C also told HDC that she believed that the prescription of clonazepam was to relieve Mr A's distress and anxiety related to his end-stage respiratory failure, and that she did not link the use of clonazepam with supporting Mr A to tolerate BiPAP.

183. RN Carey advised me that she has concerns about the care RN C provided Mr A during her shift on Sunday. In particular, RN Carey stated that she disagreed with the decision not to maintain Mr A on BiPAP therapy, as it was contrary to his medical plan. She further stated that she considered there to have been a significant lack of critical thinking behind the decision to cease Mr A's BiPAP therapy. However, RN Carey also commented that the documented medical plan to continue BiPAP "as tolerated" facilitated the poor decision-making.

184. RN Carey was also critical that Mr A was administered oxygen therapy higher than the upper limit of 90% (as specified by Dr G). She further advised that Mr A's hypoxia (SpO_2 60%) was a significant clinical feature that should have been taken into account by RN C. RN Carey stated that a patient with agitation and hypoxia should be managed by prompt referral for a medical review, and she is critical that this was not done in Mr A's case.

185. RN Carey also advised that despite the documented advice by Dr G for the use of back-to-back nebulisers if Mr A had persistent SpO_2 below 80%, that did not occur.

186. In addition, RN Carey stated that she has reservations about Mr A having been administered clonazepam drops at 5.15pm, 7.15pm, and 9.15pm, and is concerned that it was not used to assist Mr A to tolerate the BiPAP over the course of the shift. RN C believed that the clonazepam was to relieve Mr A's distress and anxiety relating to his end-stage respiratory failure, and did not link the use of clonazepam with supporting him to tolerate BiPAP. I accept that the rationale for the use of clonazepam was not recorded, but consider that RN C demonstrated a concerning lack of critical thinking in this regard.

187. RN Carey stated that the nursing care provided over this shift was, at a minimum, a moderate departure from accepted standards. However, she noted the following mitigating factors:

- The documented medical plan included BiPAP if/as tolerated;
- RN C's administration of two-hourly clonazepam was sanctioned by the prescription; and
- RN C had been on duty on Saturday when the decision was made to transfer Mr A to a side room because of his deteriorating condition.

188. In my view, the nursing care RN C provided to Mr A was poor. I am particularly concerned about her use of oxygen therapy and her failure to seek a medical review of Mr A. Overall, I consider that RN C failed to provide services to Mr A with reasonable care and skill and breached Right 4(1) of the Code.

Documentation and frequency of observations

189. RN Carey advised me that despite Mr A's respiration rate being greater than 30 breaths per minute during RN C's shift on Sunday, Mr A's vital signs were not checked as frequently as recommended on the adult observation chart. I note that the adult observation chart stated that where a patient's respiration rate was greater than or equal to 25 breaths per minute, then the frequency of observations should be increased to hourly and the medical team should be informed urgently.

190. RN C told HDC that she did not document all the observations she took during her shift on Sunday, "as [her] thinking was 'if no change' then it wasn't required". I am critical that RN C failed to document the observations she took during this shift appropriately.

Opinion: Dr G — breach

191. At the time of these events, Dr G was a medical registrar at the public hospital. On Saturday he saw Mr A, who at that time was not using BiPAP. Mr A's SpO_2 was stable at 89–92% on 2L/min of oxygen. Dr G's clinical plan was to maintain Mr A's SpO_2 levels between 85–90%. If Mr A's SpO_2 was "persistently" less that 85% then he was to be put back on BiPAP.

192. My expert respiratory and general physician advisor, Dr Conroy Wong, advised that Dr G documented a full assessment and an appropriate plan. However, Dr Wong said that it was a mild departure from accepted practice to state a lower limit of oxygen saturation of 85%, as the lower limit should have been 88%.

193. Following his review of Mr A on Saturday, Dr G did not record any instruction about the oxygen delivery system to use if Mr A was unable to tolerate the BiPAP treatment. Dr G said that he did not do so because his expectation was that the nurses would know why saturations are kept within a tight range in patients with COPD exacerbations. He stated that, in retrospect, he considers that he should have prescribed a controlled option delivery device such as a Venturi mask.

194. At 6pm Mr A was drowsy and his SpO_2 was 72%. RN D contacted Dr H and recommenced Mr A on BiPAP. At 7pm Dr H reviewed Mr A, whose SpO_2 had dropped to 71%. Dr H again contacted Dr G and informed him of Mr A's deterioration.

195. Dr G said he thought that Mr A was at his ceiling of care because he was on BiPAP, and because he "had in mind that [Mr A] was not for intubation or ventilation". Dr G stated that he agreed with Dr H's decision to move Mr A to a side room, but said that

the reason for doing so was to allow the other patients in the four-bed room to rest, rather than to stop active treatment or commence end-of-life cares.

196. Dr G did not contact the on-call consultant that evening when Mr A deteriorated. Dr G accepts that he should have done so. Dr Wong advised that it was a moderate departure from the accepted standard of practice not to discuss the situation with the on-call senior medical officer, as Mr A was being actively treated with BiPAP treatment and was deteriorating. However, Dr Wong noted that Mr A's condition was discussed at the Sunday morning handover, and that Dr G reviewed Mr A again that morning. Dr Wong advised that Dr G gave adequate and appropriate care to Mr A in relation to his two clinical reviews.

197. I note that Dr G stated that he was affected by the attitude among some of his peers that "registrars should be competent and self sufficient and able to 'handle' problems without involving a consultant". Dr G told HDC that as a result of this perceived attitude, he assumed too much responsibility and overlooked his lack of experience in the role of a registrar. I note that Dr G stated that he now knows that that attitude is unhelpful, and has changed his practice to make it routine to involve consultants in difficult decisions.

198. I am concerned that Dr G did not specify the correct SpO_2 levels or record any instruction about the oxygen delivery system to use if Mr A was unable to tolerate the BiPAP treatment. I am also critical that Dr G did not consult the on-call consultant to discuss Mr A's deterioration. I consider this to be a missed opportunity to have a senior medical officer review Mr A's condition and treatment plan. Accordingly, I consider that Dr G failed to provide services to Mr A with reasonable care and skill and breached Right 4(1) of the Code.

Recommendations

199. I recommend that Bay of Plenty District Health Board:

a) Consider whether a guideline on prescribing sedation for patients treated with non-invasive ventilation would improve safety.

b) Review the nurse-to-patient ratio in the respiratory ward and the availability of monitoring equipment and facilities.

c) Review and supply HDC with details of the training provided to nursing staff regarding the management of non-invasive ventilation and patients at risk of hypercapnic respiratory failure.

d) Provide further education to clinical staff on the importance of accurate and detailed documentation.

e) Include information within the training and induction material that the asking of questions and reporting of concerns is expected and accepted from all members

of the multidisciplinary team. BOPDHB is to supply a copy of the training and induction material, and report to HDC on the steps taken to ensure that there is a culture that encourages these actions.

200. Bay of Plenty District Health Board is to report back to HDC on the outcome of these recommendations within six months of the date of this report.

201. I recommend that Bay of Plenty District Health Board provide a report to HDC confirming the implementation of the recommendations and actions following its investigation into these events, and any associated education provided. The update is to be sent to HDC within six months of the date of this report.

202. I recommend that RN C:

a) Arrange for education and training on when to seek a medical review of a patient who is restless and agitated and requires one-on-one nursing care.

b) Amend her practice to ensure that she consistently follows the early warning triggers specified on BOPDHB's observation charts and/or seeks medical review of the patient so that vital sign parameters are changed appropriately.

203. RN C is to report back to HDC on the outcome of these recommendations, and supply evidence of the training completed, within six months of the date of this report.

204. In response to my provisional opinion, Bay of Plenty District Health Board and RN C supplied HDC with an apology letter to Mr A's family. I recommend that RN D and Dr G each separately apologise to Mr A's family for the failings identified in this report. The apologies are to be sent to HDC within three weeks of the date of this report, for forwarding to Mr A's family.

Follow-up actions

205. A copy of this report will be sent to the Coroner.

206. A copy of this report with details identifying the parties removed, except Bay of Plenty District Health Board and the experts who advised on this case, will be sent to the Nursing Council of New Zealand, and it will be advised of the names of RN C and RN D.

207. A copy of this report with details identifying the parties removed, except Bay of Plenty District Health Board and the experts who advised on this case, will be sent to the Medical Council of New Zealand, and it will be advised of Dr G's name.

208. A copy of this report with details identifying the parties removed, except Bay of Plenty District Health Board and the experts who advised in this case, will be sent to the Central TAS and the Asthma and Respiratory Foundation New Zealand, and will be placed on the Health and Disability Commissioner's website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent Respiratory and General Physician advice to the Commissioner

Report One

The following expert advice was obtained from Respiratory and General Physician Dr Conroy Wong:

> "I have been asked to provide an opinion to the Commissioner on case number 15/00643 and have read and agree to follow the Commissioner's Guidelines for Independent Advisors.
>
> My name is Conroy Wong. I am a Respiratory and General Physician and have been employed for 16 years in that role at Counties Manukau DHB. I was Clinical Head of Respiratory Medicine at Middlemore Hospital from 2006 to 2014. My undergraduate training was in Dunedin at the University of Otago, and my advanced training in respiratory medicine was completed at Green Lane Hospital in Auckland. I spent 5 years in Nottingham, UK, doing postgraduate research in asthma and clinical duties in respiratory and general medicine, before returning to New Zealand. I have the following qualifications and professional memberships — MBChB, Dip Obs, FRACP, CCST (UK). My clinical and research interests include diseases of the airways (asthma, COPD and bronchiectasis) and pulmonary infections.
>
> The advice requested was as follows:
>
> 1. To the extent that your expertise allows, the adequacy and appropriateness of the medical services [Mr A] received during his presentation to the Emergency Department on [Thursday].
>
> 2. The appropriateness of the decision to transfer [Mr A] to the Admissions Planning Unit (APU) and not the High Dependency Unit (HDU) on [Thursday].
>
> 3. The adequacy and appropriateness of the medical services [Mr A] received during his admission to the APU on [Friday].
>
> 4. The adequacy and appropriateness of the medical services [Mr A] received during his admission to [the ward] between [Friday] and [Monday], including but not limited to:
>
>   a) The decision to prescribe and continue to administer clonazepam, morphine and any other sedation medication to [Mr A] prior to senior medical officer (SMO) [Dr O's] decision to commence comfort cares on [Monday morning];
>
>   b) Whether the on-call SMO, [Dr O] and/or SMO [Dr I] should have been contacted by relevant duty registrars regarding [Mr A's] deteriorating condition.

c) The frequency of medical officer review [Mr A] received on [Sunday] and [Monday].

d) The supervision of house officers by the relevant duty registrars.

e) The supervision and direction medical staff provided to nursing staff regarding the maintenance of [Mr A's] oxygen saturation levels.

5. The adequacy and appropriateness of the services provided by on-call SMO, [Dr O] including (but not limited to):

   a) His assessment of [Mr A];

   b) His decision to commence comfort cares; and

   c) Whether he should have consulted with SMO [Dr I] before deciding to stop active treatment.

6. The adequacy and appropriateness of the services provided by SMO [Dr I], including the appropriateness of her decision to commence and continue [Mr A] on BiPAP therapy.

7. The adequacy and appropriateness of the standard of clinical record keeping of relevant medical officers between [Thursday]–[Monday].

8. The adequacy and appropriateness of the continuity of care [Mr A] received upon transfer from APU to the ward.

9. The adequacy and appropriateness of the relevant policies and procedures in place at the public hospital [in 2015].

10. Please also comment on any other aspects of the medical care provided to [Mr A] that you consider relevant.

Sources of information reviewed

1. [Mr A's] clinical records
2. BOPDHB's letter and attachments dated [date]
3. BOPDHB's letter and attachments dated January 2016
4. [RN C's] statement 4 August 2016
5. Transcript of meeting between BOPDHB and [Mr B] (son)
6. Complaint letter

Factual summary

[Thursday]

On [Thursday], at 12.20 pm [Mr A] (aged 83 years) presented to [the public hospital's] Emergency Department (ED) with shortness of breath following a referral from his [GP]. [The GP] stated in his referral letter that [Mr A] had 'severe end-stage emphysema/pulmonary hypertension'. [Mr A] was triaged as category 2.

At 1300 hrs [Mr A] was reviewed by ED registrar, [Dr J], who rang [Dr I] (general medical and respiratory consultant) to discuss [Mr A's] presentation. He was assessed as having an exacerbation of chronic obstructive airways disease (COPD). Previous spirometry in 2013 showed very severe disease with a FEV_1 0.6L (23% of predicted). A chest x-ray performed at 1331hrs was reported as showing left lower lobe pneumonia and a smaller region of infection at the right lung base. An initial arterial blood gas showed a pH of 7.25, pCO_2 12.5, pO_2 8.5, HCO_3 40.6. It was decided to start [Mr A] on BiPAP (bilevel positive airway pressure) treatment in the ED. The BiPAP observation chart records that BiPAP was commenced at 1400hrs.

At 1445 hrs [Dr I] reviewed the patient and noted that he was '*now more comfortable'*. A plan was made to continue BiPAP with the aim to reach oxygen saturation levels between 88–92%. After reviewing [Mr A] again, [Dr J] discussed a transfer to the High Dependency Unit (HDU) with [an intensive care consultant] because [Mr A's] systolic blood pressure was below 100. He was not transferred to the HDU because it was full and he was transferred to the Admission Planning Unit (APU) at 1845hrs.

[Friday]

At 0840 hrs, [Dr I] reviewed [Mr A] and the notes document that he '*feels improved*'. His oxygen saturation was recorded as 88% on 2L and respiratory rate was 20 breaths per minute. The plan was to '*encourage BiPAP for as long as possible today'*. Arterial blood gas samples taken at 1140 hrs and 1420 hrs showed improvement with pH levels of 7.2 and 7.34 respectively. It was documented that [Mr A] was transferred to the ward '*around 2030 hrs'* and he received BiPAP treatment that evening.

[Saturday]

[Mr A's] respiratory rate was recorded as 30 breaths per minute at 0215hrs (recorded in notes as '*1215*'). This had increased from rates of 20 breaths per minute or less that were recorded on multiple occasions between 0245 hrs–2235 hrs on [Friday].

A note (time not specified) in the case notes states that [Mr A] was 'awake *all night — difficulty tolerating BiPAP … kept taking mask off … d/w OCHO — to continue with BiPAP overnight*'.

The next entry in the clinical notes is at 1345 hrs and is documented by a registrar (unnamed, [Dr G] later made a statement that he saw the patient at this time) who recorded that [Mr A] was '*off BiPAP since morning, feels better'*. The respiratory rate at this time remained elevated at 30 breaths per minute. The registrar's clinical plan was to '*keep SpO_2 85–90%. If SpO_2 persistently <85%, can put back on BiPAP*'. The nursing notes confirm that [Mr A's] BiPAP was off since 0930hrs.

Later in the afternoon (time not recorded), [Mr A] became more short of breath after transfer to the bathroom on commode without oxygen. Morphine elixir (2.5 mg) and clonazepam (2 drops) were given for the first time to [Mr A] at 1645hrs. No note of an assessment of the patient or decision to prescribe sedation was made by a house officer.

At 1800hrs the patient was found to be drowsy with oxygen saturation of 72%. Respiratory rate 32 breaths per minute. BiPAP reinstated at 1820hrs.

Dr H (on-call house officer) was called because the oxygen saturation was 71% and he reviewed the patient at 1900hrs. He noted that [Mr A] was very drowsy and BiPAP was on. Arterial pH at 1930hrs showed increased respiratory acidosis with pH 7.27 and pCO_2 10.2. His condition was discussed with registrar [Dr G] and it was noted that [Mr A] was '*unlikely to benefit from further escalation*'. [Mr A] was transferred to a side room. Oxygen delivery was recorded as 15 L/min at 1935 hrs — prior to this time he had been having 3 L/min.

At 2130hrs the ward nurse recorded that [Mr A] became restless and agitated. Dr H reviewed [Mr A] again and noted that oxygen saturations were improving and that his level of awareness was improving. At 2135hrs [Mr A] was given further clonazepam. The house surgeon's plan was to continue BiPAP overnight but noted that if the patient was unable to tolerate this it could be removed with an aim of maintaining oxygen saturations between 85% and 92%. A progress note from the nurse at 2130 hrs noted that BiPAP was discontinued. Oxygen was given by mask at 5 L/min.

[Sunday]

At 0210 hrs the nursing notes record that [Mr A] was not responding. Oxygen was weaned to 1.5 L/min via mask. SpO_2 was >95%.

On call house officer [Dr K] reviewed [Mr A] (time not specified) and took an arterial blood gas sample at 0116 hrs. This showed a pH of 7.08, pCO_2 19.3, pO_2 13.8, SpO_2 96.4%. He noted that the patient was saturating at 98% on 3 L/min oxygen via mask despite a request to maintain between 85–92%. GCS was 3/15. BiPAP was recommenced at IPAP pressure 14 and EPAP 4. He reported that after 20 minutes the patient became responsive to pain followed by spontaneous eye opening about 10 minutes later. He wrote a plan to aim for oxygen saturations between 85–90% ('no higher than 92%').

BiPAP was increased to 16/6 at 0330hrs but reduced to 14/4 because of desaturation to 74%. [Dr K] reviewed [Mr A] again at 0515 hrs. He noted that the SpO_2 at that time was 88–90% on 2 L/min oxygen. The patient was '*aware and responding to voice. Eyes opened*'. Repeat ABG showed pH 7.30, pCO_2 10.14, pO_2 6.9.

A nursing note at 0800hrs noted that [Mr A] appeared alert. BiPAP was removed for breakfast. A further note at 1445 hrs stated that he remained fairly stable throughout the morning.

At some point during the afternoon/evening (no time stamp) a nursing note stated that the patient remained critically unwell and that [Mr A] was restless and required 4 staff members to contain him. Clonazepam was given at 1715 hrs and 1915 hrs. The patient was noted as being unable to tolerate BiPAP. A non-rebreathing mask was '*working well*' at 3L/min and keeping saturations at 92%. The patient was '*now and then switching to nasal prongs*'.

The observation chart showed that oxygen saturations between 1800hrs and 2020hrs ranged between71% and 83%. Oxygen saturations were ≥ 96% between 2140hrs and 0200hrs.

[Monday]

The first nursing note recorded on [Monday] (no time stamp), presumably during the early hours of the morning, records [Mr A's] oxygen saturations as '89–90% — via mask'. It was documented that [Mr A] was restless but 'slept most of the night'.

At 1045 hrs, locum medical SMO [Dr O] reviewed [Mr A] and documented that the '*son says he has been unconscious since last night*'. He confirmed that [Mr A] was unconscious and unrousable with sternal stimulus. He explained to the family that the prognosis was poor and that [Mr A] was very unlikely to improve. A plan was made to stop active treatment and commence 'comfort care'.

At 1212 hrs [Dr I] reviewed [Mr A] who noted that [Mr A] was on '*re-breather since yest afternoon — not on BiPAP*'.

At 1450 hrs [a house officer] documented that he was '*called to certify [Mr A's] passing*'.

At 1700 hrs [Dr I] documented that '*Have discussed with coroner as BiPAP changed to oxygen therapy without change of plan by doctor*'.

Issue 1: Adequacy and appropriateness of the medical services [Mr A] received during his presentation to the Emergency Department on [Thursday]

The initial assessment and management of [Mr A] in the Emergency Department was of a high standard and did not depart from accepted practice.

Issue 2: The appropriateness of the decision to transfer [Mr A] to the Admissions Planning Unit (APU) and not the High Dependency Unit (HDU) on [Thursday].

This was in line with accepted practice. As the HDU was full, it was not possible to transfer him immediately to the HDU. Even if the HDU was not full, in my experience, it is unusual for patients with very severe COPD to be transferred to a HDU in New Zealand because of limited resources and the poor prognostic outlook for these patients. The reason for asking for transfer to the HDU was a low systolic blood pressure. This had stabilised (systolic blood pressure >120 mmHg) at the time of transfer to the APU. Patients with very severe COPD (which [Mr A] had) may be managed in APUs or respiratory wards after initial

stabilisation in the ED resuscitation area. This is, however, contingent on the availability of appropriate nursing expertise and experience in non-invasive ventilation (BiPAP) treatment in the APU (of which I do not have specific information).

Issue 3: The adequacy and appropriateness of the medical services [Mr A] received during his admission to the APU on [Friday]

This appears to have been appropriate and effective. [Mr A's] observations were stable, he had appropriate arterial blood gas sampling (showing improving pH levels) and he was reviewed by the consultant physician in the morning.

Issue 4: The adequacy and appropriateness of the medical services [Mr A] received during his admission to the ward between [Friday–Monday], including but not limited to:

a. The decision to prescribe and continue to administer clonazepam, morphine and any other sedation medication to [Mr A] prior to senior medical officer (SMO) [Dr O's] decision to commence comfort cares on [Monday morning.]

The use of clonazepam and morphine to improve tolerance of BiPAP treatment is in line with accepted practice. The house officer involved ([Dr H]) noted that he had had experience with the use of sedation in patients who were tolerating BiPAP poorly. However, the house officer's decision to prescribe sedation without consultation with a registrar and not to record an assessment of the acute deterioration of the patient in the notes is a moderate deviation from accepted practice. In addition, a decision to sedate a patient after an acute deterioration (after transfer to the bathroom) is questionable.

The use of sedation by physicians in hypercapnic respiratory failure is highly variable but is an accepted practice. The doses given to the patient were not excessive. A recent British Thoracic Society guideline on the management of hypercapnic respiratory failure states that 'There is inadequate evidence to guide the use of sedation/anxiolysis in acute NIV. In the agitated/distressed and/or tachypnoeic individual on NIV, intravenous morphine 2.5–5 mg (± benzodiazepine) may provide symptom relief and may improve tolerance of NIV' (*BTS/ICS guideline for the ventilatory management of acute hypercapnic respiratory failure in adults. Thorax 2016;71*).

Although there is reasonable evidence for the use of morphine (but limited evidence for clonazepam) in patients with COPD and troublesome shortness of breath (*Vozoris N et al. The need to address increasing opioid use in elderly COPD patients. Exp Rev Resp Med 2016;10:245*), the response to these medications can be unpredictable, particularly in elderly patients. [Mr A] subsequently became drowsy and I believe that the administration of morphine and clonazepam contributed to this.

b. Whether the on-call SMO, [Dr O] and/or SMO [Dr I] should have been contacted by relevant duty registrars regarding [Mr A's] deteriorating condition.

[Dr I] was not on call for the weekend and it was therefore appropriate that she was not contacted by duty registrars.

An important decision appears to have been made on [Saturday evening] when the house officer contacted the registrar because [Mr A's] condition had deteriorated significantly. A decision was made to transfer [Mr A] to a side room and it was noted that [Mr A] was '*unlikely to benefit from further escalation*'. It is a moderate departure from accepted practice not to discuss the situation with the on call SMO as the patient was being actively treated with BiPAP treatment and was deteriorating.

c. The frequency of medical officer review [Mr A] received on [Sunday] and [Monday].

The frequency of house officer reviews was in line with accepted practice. The house officers responded to calls from nurses to review the patient appropriately on multiple occasions.

The frequency of registrar review was more limited. He was reviewed by a registrar on [Saturday] (at 1345hrs). No other registrar review was documented but [Dr G] stated that he saw the patient on [Sunday morning] but did not document this in the notes. If he reviewed the patient on [Sunday], then the frequency of routine review (daily) is in line with accepted practice. If he did not review the patient, then this would have been a moderate departure from accepted practice as patients on BiPAP should be reviewed at least daily as a routine.

d. The supervision of house officers by the relevant duty registrars.

Medical officer contact with [Mr A] on [Sunday] and [Monday] was mainly by house officers. A registrar was called once by the house officer on [Saturday evening] as noted in response b above. An undocumented discussion with a registrar also occurred in the early hours of [Monday] (statement from registrar [Dr L]). I don't believe that the supervision of the house officers was a significant departure from accepted practice and registrars usually only oversight house officers when called by them for difficult situations. It appears that the relevant details were discussed and guidance was given to the house officers.

e. The supervision and direction medical staff provided to nursing staff regarding the maintenance of [Mr A's] oxygen saturation levels.

On admission the recommended oxygen saturation range was 88–92%, which is the internationally accepted recommendation (BTS guideline for emergency oxygen use in adult patients. Thorax 2008;63 (supplement); Thoracic Society of Australia and New Zealand oxygen guidelines for acute oxygen use in adults: 'Swimming between the flags'. Respirology 2016;21:76).

During [the weekend] a range of 85–92% was repeatedly stated. This is a mild departure from accepted practice because the lower limit of saturation should have been 88%. However, the more important guidance is an upper limit of 92%, which was correctly advised.

I could not find a record of any instruction by the medical team about the oxygen delivery system to use if [Mr A] was unable to tolerate BiPAP treatment. The notes indicate that knowledge about the delivery systems and management of oxygen by staff was inadequate. The patient was inappropriately treated with a non-rebreathing mask and oxygen was delivered at a low flow rate of 2–3 L/min (flow rates should be 10–15 L/min). A non-rebreathing mask is used to deliver very high concentrations of oxygen and is not appropriate for patients with COPD and hypercapnic respiratory failure. [Mr A] also had oxygen delivered by a Hudson or simple face mask at low flow rates. This mask is also not recommended in hypercapnic respiratory failure because of the high concentrations of oxygen delivered. If it is used the flow rate should be 5–10 L/min to prevent CO_2 retention. The recommended oxygen delivery systems are nasal cannulae or Venturi masks (*Thorax 2008;63:supplement).*

Issue 5: The adequacy and appropriateness of the services provided by on-call SMO, [Dr O] including (but not limited to):

a) His assessment of [Mr A];

b) His decision to commence comfort cares; and

c) Whether he should have consulted with SMO [Dr I] before deciding to stop active treatment.

[Dr O] assessed [Mr A] for the first time on [Monday morning]. He did not assess the patient during [the weekend]. I do not know the full details of the responsibilities of SMOs during weekends. However, [Dr I's] statement of events, implies that it was not routine practice for SMOs to see patients on BiPAP treatment. She stated that following [Mr A's] death, 'it was now mandatory that a patient receiving BiPAP therapy is reviewed by a consultant physician every day'.

[Dr O's] assessment of [Mr A] on [Monday] was adequate and appropriate. He assessed [Mr A] as being unconscious and that it was appropriate to withdraw treatment. [Dr I] reviewed [Mr A] 1.5 hrs later and agreed with [Dr O's] assessment.

It was not necessary to consult with [Dr I] before deciding to stop treatment as it was clear at the time of his assessment that [Mr A] was in a terminal phase.

Issue 6: The adequacy and appropriateness of the services provided by SMO [Dr I], including the appropriateness of her decision to commence and continue [Mr A] on BiPAP therapy.

It was appropriate to commence [Mr A] on BiPAP therapy as [Mr A] was '*living an independent life with the need for home assistance*' according to his son. In addition, he had no other active comorbidities. He responded well initially to overall treatment and was noted to have improved the morning after admission. His arterial pH had also improved significantly, indicating an improvement in his respiratory status.

Issue 7: The adequacy and appropriateness of the standard of clinical record keeping of relevant medical officers between [Thursday]–[Monday].

The clinical record keeping was mostly adequate and appropriate. Times stamps were not written on several assessments (see factual summary), which is a mild deviation from accepted practice. On two occasions the record keeping was inadequate.

[Dr H] did not document the clinical status of the patient after acutely deteriorating when transferred to the toilet. He prescribed clonazepam and midazolam for this [for] [Mr A] after this episode but did not document in the notes that he did this or why.

[Dr G] did not document his review of the patient on [Saturday afternoon].

These are both moderate deviations from accepted standards of care.

Issue 8: The adequacy and appropriateness of the continuity of care [Mr A] received upon transfer from APU to the ward.

[Mr A's] condition deteriorated significantly after he was transferred from APU to the ward.

The continuity of care provided in the ward is in line with accepted standards of care. I don't believe that continuity of care was a key issue in [Mr A's] deterioration. Nurses and doctors appeared to be appropriately informed of his acute medical problems.

It is common in hospitals for patients to be managed by teams of different nurses and doctors during weekends. It is optimal to have continuity of care in terms of staff but, due to resource constraints, this is often not practical. I do not believe that this was a major factor in the outcome for [Mr A].

Issue 9: The adequacy and appropriateness of the relevant policies and procedures in place at [the public hospital] [in 2015].

Oxygen delivery protocol: This was taken from the Lippincott Nursing Procedure Manual. This describes the various forms of oxygen delivery but does not provide specific guidance of the appropriate use of oxygen in different patient scenarios. In particular, there are no guidelines or cautions about the use of high flow oxygen in patients at risk of hypercapnic respiratory failure. It is inadequate as an independent document for guiding oxygen therapy but provides useful background information on the different delivery systems. I recommend the Thoracic Society of Australia and NZ guidelines *(Respirology 2016;21:76)* and the BTS guidelines *(Thorax 2008;63 (supplement)* as a basis for using oxygen therapy.

Guideline for doctor's evening handover: This is clear and outlines a simple and practical handover process.

Non-invasive ventilation protocol: This is a reasonably comprehensive document that describes a clear process and has a checklist for assessing suitability for treatment in COPD patients. There is one important discrepancy in the protocol. There are conflicting statements about starting pressures. In one part it recommends starting pressures of IPAP 8 cm and EPAP 4 cm, which gives an IPAP starting pressure that is inappropriately low for most patients. Later it recommends starting pressures of IPAP 12 cm and EPAP 4 cm. A new BTS/ICS guideline has recently been published and I recommend updating the protocol in line with this (*Davidson AC, et al. Thorax 2016;71*).

Issue 10: Please also comment on any other aspects of the medical care provided to [Mr A] that you consider relevant.

Non-invasive ventilation of patients with very severe COPD who have an acute exacerbation is a very difficult management issue. It requires high level knowledge, skill and experience combined with a coordinated team that communicates clearly the management issues and plan. Patients should ideally be managed in a dedicated ward with skilled staff and oversight and regular review by a respiratory SMO.

This patient was very unwell with both an exacerbation of COPD (severe airway narrowing) and pneumonia (severe infection). The prognosis is often poor in these patients and minor additional stresses (e.g. mucus plugging, nocturnal bronchoconstriction, nocturnal hypoventilation, sedation from medications etc.) can easily precipitate a deteriorating course. [Mr A's] respiratory rate increased from 20 or less breaths per minute to 30 breaths per minute in the early hours of [Saturday]. I believe that this signalled a worsening of his condition. Later in the afternoon on the same day he was transferred to the toilet without oxygen and this likely precipitated a further worsening of his condition. It is uncertain if optimal management of his condition thereafter would have changed the outlook.

A major issue in [Mr A's] management was his inability to tolerate the BiPAP treatment. I am unable to determine whether this was primarily due to patient factors or nursing/medical care but it is likely that both factors were contributory. His intolerance of BiPAP inevitably made management of his low oxygen levels extremely difficult because of the need to give him enough oxygen but not too much.

Communication about the plans and requirement for BiPAP ventilation was not always clear. The house surgeon's plan at 2135hrs on [Saturday] was to continue BiPAP overnight but he noted that if the patient was unable to tolerate this it could be removed with an aim of maintaining oxygen saturations between 85% and 92%. It may have been appropriate to stop BiPAP at that stage but it appeared that the nurses were left to judge when [Mr A] should or should not have BiPAP. On the pm shift on [Sunday], [RN C] noted in her statement that [Mr A] refused BiPAP treatment and that she '*respected his right to refuse*'. In essence, this was a decision to treat him palliatively (he was given further clonazepam), which may have been appropriate. However, she should have

discussed the decision to stop his BiPAP with medical staff. Overall, the lack of clear SMO oversight of the management of this patient during the weekend meant that definitive decisions about BiPAP treatment and changing the management to palliative care were not made."

Report Two
Further advice was obtained on 26 March 2017:

"I have been asked to provide a further opinion to the Commissioner on case number 15/00643.

Sources of information reviewed

1. Letter of complaint dated [date]
2. Transcript of meeting between BOPDHB and [Mr B] (son)
3. BOPDHB letter dated [2015] and attachments (including clinical notes).
4. BOPDHB letter dated 15 January 2016 and attachments.
5. [RN C's] statement dated 4 August 2016.
6. BOPDHB email dated 1 September 2016 containing Radiology report.
7. [Dr G's] email dated 9 February 2017 and attachments (including a response to your expert advice report).
8. [RN C's] letter dated 9 February 2017.
9. [RN D's] letter dated 10 February 2017.
10. BOPDHB letter dated 13 February 2017 and attachments (including [Dr H], [Dr I], [Dr O] and [Dr P's] response to your expert advice report).
11. [Dr G's] email dated 23 February 2017 and attachments.
12. BOPDHB [quality and patient safety manager's] email dated 27 February 2017 and attachments (policy regarding SMO/RMO responsibilities).
13. SMO [Dr Q's] email regarding your expert advice dated 5 March 2017.
14. [RN F's] statement dated 6 March 2017.

Issue 1: With reference to the relevant BOPDHB guidelines, please comment on the adequacy and appropriateness of the care provided by the following SMOs to [Mr A] [in 2015]:

a. [Dr I] — She provided good quality care to this patient on [Thursday] and [Friday] prior to the weekend. She discussed the management of [Mr A] by phone with the ED registrar on presentation to the hospital [Thursday] (early afternoon). She then reviewed the patient at 1445hrs and again the following morning ([Friday]).

b. [Dr Q] — He was not involved in [Mr A's] care in any way.

c. [Dr O] — He saw [Mr A] once on [Monday], when [Mr A] was assessed to be in a terminal phase of his illness. He was not contacted by junior doctors about [Mr A] during [Saturday and Sunday] and therefore did not provide supervision to the junior clinical staff during this period. In [Dr G's] statement he notes that [Mr A] was discussed in the morning handover ([Sunday]), which

> was attended by [Dr O]. [Dr G] noted that [Mr A] was very unwell and was not tolerating non-invasive ventilation well. I do not have sufficient information about the morning discussion to determine if SMO review was warranted but the patient was stated to have been reviewed by [Dr G] (registrar) after the morning handover on [Sunday] and he felt the patient was stable and did not deem it necessary to contact the on-call SMO.

[Dr O's] supervision was in line with BOPDHB guidelines at the time but these have now changed to require daily review of patients of this type. In 2015, his care was in line with accepted practice and appropriate.

Recommended improvements

1. I agree with the changes made by BOPDHB (noted in response by [the] Chief Executive). All patients on non-invasive ventilation are now to be reviewed daily by a consultant.

Issue 2: With reference to relevant BOPDHB guidelines, please comment on the adequacy and appropriateness of the services provided to [Mr A] [in 2015] by:

a. [Dr G] — He reviewed [Mr A] on [Saturday] (1345 hrs) and documented a full assessment and appropriate plan. He was contacted by House Officer [Dr H] on [Saturday evening] after [Mr A's] condition deteriorated. It is a moderate departure from accepted practice not to discuss the situation with the on-call SMO. However, in [Dr G's] response, he notes that the condition of [Mr A] was discussed at the morning handover on [Sunday]. This meeting was attended by the SMOs on-call during the weekend.

He also stated in his response that he reviewed the patient on [Sunday morning] and documented the assessment without clearly writing his name or time stamping it. The note appears after a nursing note time-stamped at 1445hrs. This note appears to have been written by [Dr G]. Based on the documented first assessment and accepting that he was reviewed in the morning on [Sunday] (corroborated by nurse [RN C's] response), [Dr G] gave adequate and appropriate care to [Mr A] in relation to his two clinical reviews.

b. [Dr H] — He prescribed morphine and clonazepam for [Mr A] on [Saturday afternoon]. It is unclear if he assessed [Mr A] because no documentation was present in the medical notes. He reviewed [Mr A] on [Saturday] (1900 hrs) and appropriately discussed his condition with [Dr G]. He next reviewed [Mr A] shortly after 2130 hrs on the same day.

The house officer's decision to prescribe sedation without consultation with a registrar and not to record an assessment of the acute deterioration of the patient in the notes is a moderate deviation from accepted practice. Accepted practice for prescribing sedation is at least discussion with a registrar.

However, the deviation from accepted practice is not necessarily the fault of the house officer involved. Sedation is an accepted practice and he had some

experience with prescribing for similar patients. Inadequate guidelines and safety checks were in place to question the appropriateness of the treatment.

Recommended improvements

1. Further education and reminders about the importance of documentation in the notes.

2. Prescribing of sedation should be undertaken in consultation with the Registrar or SMO. This has been formalised as a standard of care by BOPDHB (noted in response by [the] Chief Executive). To add a further layer of safety, nurses should be informed of this decision and should be encouraged to question deviations from this directive. In addition, a guideline on prescribing of sedation for patients treated with non-invasive ventilation would improve safety.

Issue 3: To the extent your expertise allows, please comment on the adequacy and appropriateness of the services provided by BOPDHB to [Mr A] including but not limited to:

a) Handover of care between [Dr I] and [Dr O] [in 2015] — No handover of care was made between the two consultants. The accepted standard of care is that the care of sick or unstable patients should be handed over to the teams on duty over the weekend. This does not need to be consultant to consultant communication but this is optimal if the patient is complex or very unwell. In [Dr G's] response he notes that [Mr A's] case was discussed at a handover meeting on [Friday] at 3.30 pm. Therefore, there was adequate handover of a patient who was unwell but stable prior to the weekend.

b) The systems and processes current at the time of these events ([2015]), including but not limited to the decision to transfer [Mr A] to the [medical ward]. The system of care for patients on non-invasive ventilation is an important issue and this was not ideal in 2015. Patients should ideally be cared for in a designated ward with the facilities and skilled staff to manage these complex patients. Routine handover of care is part of this system.

An international recommendation (Thorax 2016; 71:ii1–ii35) is that 'non-invasive ventilation should take place in a clinical environment with enhanced nursing and monitoring facilities that are beyond those of a general medical ward'.

BOPDHB standard of care in 2015 was therefore suboptimal. It was a moderate deviation from international guidelines.

Recommended improvements

1. I agree with BOPDHB changes to concentrate care initially in the ED and APU followed by HDU or the respiratory ward. The respiratory ward should allow for additional nurses (reduced nurse to patient ratio) to allow for more intensive

monitoring. Monitoring equipment and facilities should be better than in standard wards and could include continuous monitoring capability.

c) Relevant policies and procedures including the 'Delegated responsibility of RMOs — when to call the consultant on call' current at the time of these events policy — This document is, in general, reasonable and adequate. In [Mr A's] case, the consultant could have been contacted based on points c (management is unclear) and d (any patient who deteriorates unexpectedly). However, some debate could be had about whether he fully satisfied these criteria.

My previous report noted deficiencies in the Oxygen Delivery Protocol and the Non-invasive Ventilation Protocol. These have been corrected.

Recommended improvements

1. An additional criterion could be added to the delegated responsibility of RMOs document to clarify:

a. Any patient who refuses or is not tolerating treatment and whose condition is deteriorating.

Issue 4: The adequacy and appropriateness of the actions taken by BOPDHB following the recommendations made in its internal investigation report (ref #29080) — I would like to commend [Dr P] and BOPDHB for a comprehensive review of the issues raised by this case.

The key issues have been or are being addressed. The reorganisation of the care of non-invasively ventilated patients to HDU or the respiratory ward and the mandating of daily ward rounds for these patients is very appropriate.

Recommended improvements

1. See earlier recommendations.

2. It would be useful to have an updated report of what changes have been completed and what changes are still planned. In particular, what is the current status of the dedicated non-invasive ventilation area, monitoring capability, and nursing ratios?

Issue 5: Any other matter you consider relevant to comment on:
No additional comments."

Appendix B: Independent nursing advice to the Commissioner

Report One

The following in-house expert advice was obtained from Registered Nurse Dawn Carey:

"1. Thank you for the request that I provide clinical advice in relation to the complaint from [Mr B] about the care provided to his late father by [the public hospital] [in 2015]. 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.

2. I have reviewed the following documentation available on file: complaint and correspondence from [Mr B]; response from Bay of Plenty District Health Board (BOPDHB) including the clinical notes for [Mr A] [public hospital] admission [Thursday]–[Monday], report to [the Coroner] from [Dr I], investigation report plus appendices, response to [Mr B's] questions.

3. [Mr A] had severe Chronic Obstructive Pulmonary Disease (COPD). He was admitted to [the public hospital] on [Thursday] with left lower lobe pneumonia and type 2 respiratory failure. His treatment for this included usual medical therapies and Bilevel Positive Airway Pressure (BiPAP). Following a medical review on [Friday], a plan was made for the BiPAP to continue until at least the following day and then to be weaned if [Mr A] remained well. Over the weekend, [Mr A] deteriorated despite ongoing BiPAP support. At some point on [Sunday], the BiPAP was removed and an oxygen mask substituted. It is reported that the removal of the BiPAP therapy occurred without medical input. [Mr A] continued to deteriorate and died at [the public hospital] on [Monday]. His death was referred to the duty Coroner by his Consultant Physician.

4. In response to [Mr B's] concerns that the treatment or non treatment provided to his father at [the public hospital] directly contributed to his death, I have been asked to review the nursing care provided and advise on the following:

   - Whether the nursing management provided between [Thursday] and [Monday] was reasonable?
   - In particular, whether it was reasonable for nursing staff to remove [Mr A] from BiPAP without notifying the on-call medical team first?
   - Whether it was reasonable for nursing staff to select a non-rebreathing mask for [Mr A] after removing him from BiPAP?
   - Whether the follow-up actions and recommendations made by BOPDHB are appropriate?

5. Provider response(s)

BOPDHB completed an investigation into [Mr A's] care at [the public hospital]. The investigation was informed by a file review, interviews with relevant staff members and a review of relevant organisational protocols and policies. The investigation concluded that while [Mr A's] death was not unexpected he may not have been afforded the optimal opportunity to survive during his admission. Recommendations to prevent such an occurrence in the future include:

- Removing BiPAP from use in general medical wards and establishing a dedicated area where medical patients who require non-invasive ventilation (NIV) will be placed
- Expanding the NIV order form so that goals of treatment and alternative oxygen delivery systems are specified
- Consider re-introduction of low flow oxygen delivery systems — venturi masks — to the ward setting
- All patients receiving BiPAP should receive routine medical review and be part of medical handover processes
- The oxygen devise fact sheet which is in development to be linked to the oxygen protocol
- Review processes for nebuliser use when a patient is on BiPAP and educate staff on the use of air rather than oxygen for nebuliser delivery

6. Review of clinical records focussing on scope of advice

   i. [Mr A] arrived at [the public hospital's] Emergency Department (ED) at 12.20pm and assigned triaged category 2. He was commenced on BiPAP in the ED and transferred to the Admission Planning Unit (APU) at approximately 6.45pm. [Mr A] remained in APU until approximately 8.30pm on [Friday]. A BiPAP observation chart (BOC) was commenced at 2pm on [Thursday]. This includes the levels of inspiratory and expiratory pressure support prescribed, oxygen flow prescribed and the desired peripheral oxygen saturation (SpO_2) range. Nursing documentation reports [Mr A] being managed on the prescribed BiPAP therapy except for mealtimes when it was removed so that he could eat and drink. Whilst off BiPAP, [Mr A] was administered oxygen therapy consistent with the prescribed low flow rates titrated to his desired SpO_2 range. Reviewed documentation spanning ED and APU care, indicates that [Mr A] was administered medications and fluid therapy in accordance with his prescription and that vital signs monitoring was completed at regular and appropriate intervals. I note entries reporting nursing concerns being communicated to the medical team and being actioned by a medical officer in a timely manner.

   ii. [Mr A] transferred to [the ward] at approximately 6.45pm on [Friday]. Night shift nursing reports him having a restless night; *awake all night — difficulty tolerating BiPAP. Kept taking mask off. SaO_2 91% 1LO_2.* BOC documentation indicates that BiPAP was continued overnight.

iii. [Saturday], 1.45pm [Mr A] was reviewed by the Registrar … *Off BiPAP since morning. Feels better … Plan: saline nebs to help expectorate, keep SpO2 85–90% (measure at ears), if SpO_2 persistently <85% can put back on BiPAP.* Nursing documentation reports [Mr A] being off BiPAP from 9.30am and maintaining saturations within the desired range.

Comment: In my opinion, the nursing care provided to [Mr A] from arrival to [the public hospital] ED on [Thursday] until approximately 3.15pm on [Saturday], was consistent with accepted standards.

iv. During the afternoon shift ([Saturday]), it is reported that [Mr A] became short of breath when/*following* transfer to the bathroom without oxygen therapy…*O_2 sats 94% mask 2L, B/P sats. OCHO* [on call house officer] *contacted Pt charted + given clonazepam + morphine elixir 16.45. Pt settled gradually. 18.00 found to be drowsy +++ O_2 sats 72% resp rate 32 OCHO informed. Pt ↓ responsiveness. BiPAP reinstated 18.20hrs … 20.30hrs O_2 sats rising 83% 15L BiPAP. 21.30hrs O_2 sats 96-98% Pt became restless + agitated. R/V by OCHO clonazepam given as charted. Pt settled + quietened with encouragement. BiPAP discontinued. Currently on mask 5L O_2 …* Documented vital signs for this time report [Mr A's] SpO_2 96–98%.

Comment: I disagree with [Mr A] being prescribed and administered clonazepam and morphine without medical review prior. In my opinion, such medications need to be used with caution in respiratory compromised non-intubated patients. I also disagree with the incidences where [Mr A's] SpO_2 was higher than desired and nursing staff continued to administer oxygen therapy to him. Titrated oxygen therapy to achieve SpO_2 88-92% is generally recommended in patients with an acute exacerbation of COPD to avoid hypoxemia and reduce the risk of oxygen-induced hypercapnia[1].

v. Documentation by the OCHO at 9.25pm reports [Mr A's] arterial blood gas (ABG) result from the *specimen* taken two hours prior, which indicates a significant deterioration from the previous day. The documented medical plan reports

1. Continue BiPAP overnight on same settings …
3. Wean oxygen down to lowest possible level to maintain sats 85–92% …
6. If not tolerating BiPAP can trial removing it but aim for saturations of 85–92%.

vi. At 02.10am nursing documentation reports *…settled during shift … Not responding, O2 weaned … to 1.5l via mask. SpO_2 >95% …* Night OCHO

[1] Abdo, Wilson F, and Leo MA Heunks. "Oxygen-Induced Hypercapnia in COPD: Myths and Facts." Critical Care 16.5 (2012): 323. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3682248/

review notes *patient saturating at 98% on 3L via mask despite request to maintain b/w 85–92%. O_2 turned down to 1l and ABG done → severely hypercapnoeic (pCO_2 19.31) + acidotic (pH 7.087). Patient GCS 3/15 SpO_2 now 95% on 1.5L via mask … Recommenced on BiPAP… After about 20mins, patient became responsive to pain …*

Plan: *1. cont BiPAP*
2. aim O_2 sats between 85–90% (and no higher than 92%) …

Subsequent nursing documentation for this shift reports regular vital sign observations and [Mr A] achieving the desired SpO_2 with titrating oxygen therapy via BiPAP. The OCHO reviewed [Mr A] at 5am and 7am. The last review reiterated the desired clinical parameters and … *cont on BiPAP if tolerating …*

vii. At 9.30am [Sunday], [Mr A] is reported by nursing staff as … *becoming anxious and agitated. O_2 sats ↓77% … returned to BiPAP.* BOC documentation refers to BiPAP still being in progress at 11am. At some stage, [Mr A] was reviewed by the Medical Registrar who noted that he *seems settled on BiPAP… at ceiling of care. Plan — continue BiPAP as tolerated, keep SpO_2 85–90%, if persistently* desaturates *<80%, give back-to-back nebs and encourage to cough.* Nursing documentation for 2.45pm reports *… has not needed to return to BiPAP again …* Nursing documentation from the next shift reports *Pt remains critically unwell. O_2 sats continuously monitored … Pt becomes restless @ times + desats to 60% … 4x staff to contain pt. Clonazepam drops x2 given with good effect … Pt not tolerating BiPAP. Non rebreather mask works well @ 3L keeping sats +/-92% …* Overnight [Mr A] received oxygen titrated to achieve the desired SpO_2.

viii. Medical review at 10.45am notes *… son says he has been unconscious since last night. Unconscious →not rousable to sternal* stimulus *… poor prognosis, For comfort care …* [Mr A] died with his family in attendance at approximately 2.40pm. His death was referred to the duty Coroner.

7. Clinical advice

i. Whether the nursing management provided between [Thursday] and [Monday] was reasonable?

In my opinion, the nursing care provided to [Mr A] from arrival to [the public hospital] ED on [Thursday] until approximately 3.15pm on [Saturday], was consistent with accepted standards of care.

I consider that the nursing care provided after this time was a moderate departure from accepted standards.

ii. In particular, whether it was reasonable for nursing staff to remove [Mr A] from BiPAP without notifying the on-call medical team first?

Based on the contemporaneous documented medical plans I consider that it was reasonable for nursing staff to remove [Mr A's] BiPAP for short periods of time. In my experience, patients typically struggle with NIV and for a variety of reasons such as mask discomfort, feelings of claustrophobia etc and the need for short breaks from therapy is not uncommon. However, the decision to pause a patient's BiPAP therapy needs to involve clinical decision making and be informed by the reason for the BiPAP in the first place and the patient's status. NIV is recommended as a treatment of choice for COPD patients who have persistent hypercapnia despite receiving optimal medical treatments[2]. Not tolerating NIV is typically presented by a patient becoming agitated. While the agitated behaviour can simply be the patient struggling with the confines of a tight face mask, it can also be indicative of hypoxaemia or worsening hypercapnia. Hypercapnia can only be objectively determined through ABG analysis. I would expect that all situations where ward nursing staff are struggling to maintain a patient on BiPAP or re-introduce it after a short break, are promptly communicated to a medical officer. Such communication would also be in keeping with the BOC document — ***if unstable or not tolerating BiPAP, contact medical registrar for further review*** [emphasis in original]. I would recommend that this advice is consistently communicated and followed by medical and nursing staff.

I note that the organisational investigation concluded that the relevant nursing staff thought that the discontinuation of [Mr A's] BiPAP was sanctioned and part of his allowed treatment plan. I am concerned that the nursing staff thought this and consider that there was a significant failure to appreciate why [Mr A] was prescribed BiPAP — hypercapnic respiratory failure —in the first place. I am unsure whether this was in part due to a lack of respiratory knowledge or not. I do consider that the consistent medical message of BiPAP if/as tolerated was a mitigating factor.

In conclusion, I consider it reasonable that [Mr A] was given short breaks from his BiPAP therapy. I disagree with the decision to cease [Mr A's] BiPAP therapy and consider that there was a significant lack of critical thinking behind such a decision.

[2] National Institute for Health and Care Excellence (NICE), *Guideline CG101 Chronic obstructive pulmonary disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care,* (Manchester: NICE, 2010).
Retrieved from http://www.nice.org.uk/guidance/cg101/chapter/1-recommendations

iii. **Whether it was reasonable for nursing staff to select a non-rebreathing mask for [Mr A] after removing him from BiPAP?**
No, because [Mr A] had COPD and was in type 2 respiratory failure. However, if these aspects had been consistently communicated to the nursing staff or appreciated by them, I doubt that the BiPAP therapy would have been discontinued or a non rebreather mask chosen for [Mr A]. Based on the completed investigation it appears that Venturi masks were not readily available on [the ward]. These are the masks that are recommended for use for COPD patients.

iv. **Whether the follow-up actions and recommendations made by BOPDHB are appropriate?**
Yes but I would recommend that BOPDHB keep the Commissioner informed of their progress in implementing these changes and also clarify whether recommendations under consideration — point 1 subset 3 — are enacted or not.

As noted in section 7(ii), I would also recommend that the referred to guidance on the BOC document, is consistently communicated and followed by medical and nursing staff."

Report Two

Further advice was obtained on 27 October 2016:

"1. Thank you for the request that I provide additional clinical advice on this case. 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. My advice is limited to the nursing care provided to [Mr A] during his admission [Thursday]–[Monday]. This advice should be read in conjunction with my previous advice on this complaint.

2. I have reviewed the following documentation available on file: response from Bay of Plenty District Health Board (DHB) dated 2 July 2015 which includes [Mr A's] relevant clinical notes, response dated [Thursday] 2016 which includes statements from [RN T], [RN D], [RN E], [RN M]; response from [RN C] dated 4 August 2016; my previous clinical advice dated 8 September 2015.

3. I have been asked to advise on:

   i. the adequacy and appropriateness of the care provided by individual — names supplied — registered nurses; and
   ii. whether, and to what extent any systems issues contributed to the standard of nursing care [Mr A] received.
   iii. Where relevant, please provide comment on the adequacy and appropriateness of Bay of Plenty DHB

a) policies and processes;
b) BiPAP and oxygen training provided to nursing staff; and
c) changes made to practice; and

4. The adequacy and appropriateness of the care provided by:

a) [RN T] — [Saturday], [Saturday], AM shift.
Following a further review, I have determined no cause to amend my original advice. I continue to consider that the nursing care provided to [Mr A] during this time period was consistent with accepted standards.

b) [RN D] — [Saturday], [Saturday], PM shift.
I note that [RN D's] response reports no recollection of [Mr A] or the events involved in with his care.

I am unsure whether [RN D] was involved in mobilising [Mr A] to the bathroom via a commode chair without oxygen therapy or not. If the Commissioner determines that she was, I would be critical of this and consider it worrisome practice for a RN experienced in medical care nursing.

In relation to the standard of monitoring that [RN D] provided following [Mr A's] episode of shortness of breath, I note that his documented respiratory rate — 36 — should have triggered hourly monitoring. This did not occur and I am critical of this. [Mr A] had an upper limit set for his oxygen saturations, 92%. Such a limit was necessary for [Mr A] as he was at risk of hypercapnic respiratory failure. I disagree with [Mr A] being administered oxygen therapy and his oxygen saturations being higher than the required upper limit. The documented vital signs indicate that this was the case at 4.30pm, 9.30pm and 10.15pm. Following a further review, I continue to have concerns about the standard of nursing care that [Mr A] was provided over the course of this shift and consider that it moderately departed from accepted standards.

c) [RN E] — [Saturday], [Saturday], Night shift.
[RN E's] response reports that the night shift was very busy and that she cannot recall [Mr A]. She reports working as a team with another RN, who has not provided a response or statement.

Documented vital signs at midnight indicate that [Mr A] continued to be administered oxygen therapy despite his oxygen saturations being higher than the required upper limit of 92%. While I am critical of this, I note that subsequently [Mr A] was provided with nursing care and interventions that were appropriate and consistent with accepted standards.

d) [RN M] — [Sunday], [Sunday], AM shift.

Following a further review, I consider that [Mr A] was provided with nursing care that was consistent with accepted standards.

e) [RN C] — [Sunday], [Sunday], PM shift.
I note that throughout this shift, [Mr A] did not receive BiPAP therapy. While I disagree with this and consider that this was contrary to the medical plan for [Mr A], in my opinion the documented medical plan, *continue BiPAP as tolerated* ... facilitated the nursing poor decision making in this case.

I note that despite [Mr A's] documented respiration rate being greater than 30, his vital signs were not checked as frequently as recommended on the Adult Observation Sheet and I am critical of this. I also continue to disagree with [Mr A] being *administered* oxygen therapy even though his oxygen saturations were higher than the required (revised) upper limit of 90%.

I note [RN C's] clinical notes report [Mr A] becoming restless, dropping his oxygen saturations (60%) and requiring multiple staff members to 'contain' him. I disagree strongly with [RN C's] view that as per the Patient Code of Rights[3] it was appropriate to accept [Mr A's] refusal to have BiPAP at this point. In my opinion, [Mr A's] hypoxia was a significant clinical feature that should have been taken into account by [RN C]. I consider that a patient with agitation and hypoxia should be managed by prompt referral for medical review and I am critical that this was not done in this case. I also note that despite the documented advice by the registrar for persistent low oxygen saturations (<80%) to be treated with back-to-back nebulisers this was not done. I also have reservations that [Mr A] was administered clonazepam drops at 5.15pm, 7.15pm and 9.15pm. I consider that this medication was prescribed to assist [Mr A] to tolerate the BiPAP therapy and am concerned that it was not utilised as such over the course of this shift.

Following a further review, I continue to have concerns about the standard of nursing care that [Mr A] was provided over the course of this shift. I consider that the provided nursing care at a minimum was a moderate departure from accepted standards. My criticism is mitigated to moderate by the factors such as the documented medical plan including BiPAP if/as tolerated; [RN C's] administration of two hourly clonazepam was sanctioned by the prescription, and [RN C] was on duty on [Saturday] when the decision was made to transfer [Mr A] to a side room due to his deteriorating condition.

f) [RN N] — [Sunday] Night (co-ordinator) shift.
[RN N's] response reports that he undertook the co-ordinating role as required/allocated by the Clinical Nurse Manager. On the night in

[3] Code of Health and Disability Services Consumers' Rights.

question, he reports being told in handover that [Mr A] had not been tolerating the BiPAP and that it had been stopped. He reports liaising with the RN assigned to care for [Mr A] and being told that the patient was settled and that his oxygen saturations were being kept within the indicated range. I note that the contemporaneous clinical documentation supports [RN N's] response.

The level of oversight that a shift co-ordinator provides is dependent on a multitude of factors from their level of experience, quality of shift handover communication, acuity of the patients in general, whether the co-ordinator has their own patient load, ward culture and expectations, experience of their nursing colleagues etc. In my opinion, the level of oversight that [RN N] reports providing to [Mr A's] RN is not inconsistent with accepted ward practice when the co-ordinator is undertaking the role ad hoc and working with peer colleagues as in this case.

g) [RN F] — [Sunday], [Sunday], Night shift.
[RN F] reports no recollection of [Mr A]. She also reports not having had any formal training with BiPAP but that this therapy had been discontinued on the previous shift. I note that generally [Mr A's] respiration rate and oxygen saturations were recorded at two hourly intervals and that the oxygen saturations were within the requested range. Based on the Adult Observation Sheet guideline, [Mr A's] respiration rate should have triggered hourly monitoring between midnight and 4am. This was not done and nor was the advised medical review sought. I am critical of this. Nursing documentation reports *... minimal intervention o/n as pt restless and wakeful. Slept most of the night ... appears to be stable and comfortable this shift ...* In my opinion, reports of restlessness in a patient need an appropriate level of evaluation and it is not apparent that this occurred in this case. At 6am, [Mr A's] recorded respiration rate reduced and would no longer have triggered an escalation in monitoring as per the Adult Observation Sheet guideline. His recorded level of consciousness includes A, meaning alert for this time.

h) [RN D] — [Monday] AM shift.
[RN D's] response reports no recollection of [Mr A] or the events involved in with his care. At 10.45am, [Mr A] was reviewed by the medical registrar and noted to have a Glasgow Coma Scale 3/15, *… son says he has been unconscious since last night ...* [Mr A's] care was then switched to palliative. Clinical nursing documentation reports care focused on comfort cares. In my opinion the nursing care provided by [RN D] was consistent with end of life nursing care.

5. Whether, and to what extent any systems issues contributed to the standard of nursing care [Mr A] received.

I consider that [Mr A's] nursing care was compromised somewhat by his placement on a ward other than the respiratory ward. However, it is important to acknowledge that [the public hospital] is not unique in having patients placed in 'outlier' wards.

6. Where relevant, please provide comment on the adequacy and appropriateness of Bay of Plenty DHB

a) policies and processes.

i. Clinical Practice Manual Protocol 3.1 Non-invasive ventilation BiPAP/CPAP nursing management, issued in October 2013.

This is a reasonably comprehensive document. I note that on page one it recommends a starting inspiratory pressure (IPAP) 8cmH_2O, which is a lower starting pressure than I would have expected. I would suggest that the actions specified in this Protocol are evaluated against the NIV Guidelines and Observations (draft document) to ensure consistency.

ii. NIV (BiPAP) guidelines and observations — draft document.

This is a concise document that includes a checklist focussed on COPD patients with type 2 respiratory failure and incorporates the BiPAP (nursing) Observation Chart. It also includes decision-making prompts to help inform the management plan and specifies oxygen delivery both in rate and delivery system. I note this draft document references IPAP starting pressures of 12cmH_2O. As stated above I would recommend reviewing the protocol 3.1 and the BiPAP Observation Chart against the draft addition to ensure there is consistency in instructions and advice. With the focus on patient safety I would suggest that the 'suggested NIV usage and weaning guide' is limited to the instruction that the patient should be encouraged to wear BiPAP as much as possible and to also include the prompt to contact the medical registrar for review if patient is not tolerating therapy.

iii. Resuscitation decision and ceiling of treatment plan document.

This is a new document that provides clarity about the range of active treatments deemed clinically appropriate for a patient. It includes a section that indicates that the decisions have been communicated to the medical/nursing providers, patient/EPOA, and family. I consider this document to be a useful addition.

iv. Guidelines doctor's evening handover, endorsed May 2014.

Specifies a clear and concise framework that is facilitated by the Duty Manager. Includes the validated communication tool, SBARR. I have no suggestions for improvement.

b) BiPAP and oxygen training provided to nursing staff.

The response from Bay of Plenty outlines the education topics for CPAP and BiPAP in acute care. Completion of these online education topics is prerequisite to a nurse attending the BiPAP practical workshop.

Following completion of the practical workshop, the RN is also required to undergo a clinical competency assessment. The response also details the different sessions where oxygen therapy training is provided to nursing staff. I consider that the training for BiPAP and oxygen therapy as detailed is suitably comprehensive and appears equivalent to that of other DHBs.

The submitted education plan specifies the respiratory care/system topics for in-service clinical education that were held in June 2015. The 30-minute sessions are repeated on a set day per week to facilitate nurses meeting clinical education requirements during their working day. The listed topics are appropriate.

c) Changes made to practice.
I continue to consider these to be appropriate and adequate. I would suggest that the Commissioner is kept informed of the changes that are still being finalised such as the Oxygen Protocol and implementation of the NIV draft document."

Report Three

Further advice was obtained on 27 April 2017:

"1. Thank you for the request that I provide further clinical advice on this case. In preparing this advice, 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. My advice is limited to the nursing care provided to [Mr A] during his admission [Thursday]–[Monday]. This advice should be read in conjunction with my previous two advice reports on this case.

2. I have reviewed the following documentation available on file: response from Bay of Plenty District Health Board (DHB) dated 2 July 2015 which includes [Mr A's] relevant clinical notes, response dated [Thursday] 2016 which includes statements from [RN T], [RN D], [RN E], [RN M], response dated 13 February 2017 which includes comments from [RN R] and a further response from [RN E]; response from [RN C] dated 4 August 2016 and further response dated 9 February 2017; further response from [RN D] undated but received by HDC Legal Investigator on 10 February 2017; response from [RN F] undated but received by HDC Legal Investigator on 6 March 2017; my previous clinical advice dated 8 September 2015 and 27 October 2016.

With the exception of the responses dated/received in 2017, I have reviewed the other documentation previously.

3. I have been asked to advise on:

i. The adequacy and appropriateness of the nursing services provided by [RN D], [RN C], [RN F] and [RN E].
ii. To the extent my expertise allows, the adequacy and the appropriateness of the services provided by Bay of Plenty DHB including but not limited to:
    a. Oxygen and BiPAP training provided to nursing staff caring for [Mr A]
    b. The system, processes and policies current at the time of [Mr A's] admission — [2015].

    When formulating my response to (iib), I have been asked to include comment regarding Nurse Leader Medical Service, [RN R's] response.
iii. The adequacy and appropriateness of the steps taken by Bay of Plenty DHB to implement the recommendations made in its internal investigation report, reference #29080.

4. The adequacy and appropriateness of the care provided by:

i) [RN D]

[RN D] reiterates that she has no recollection of [Mr A], including whether she was involved in mobilising him to the bathroom without oxygen therapy or not.

[RN D] details how her practice has changed since [Mr A's] death. She advises that she has improved her nursing practice in relation to handover processes; vital sign monitoring including following the Bay of Plenty DHB expected clinical response outline; clinical documentation; communication with nursing colleagues, medical staff, patients and their families; and how she utilises resources such as the Respiratory Nurse Specialist.

Following a review of [RN D's] further response I have determined no cause to amend the criticisms or level of departure presented in my previous advice. I consider the changes that [RN D] reports making to her practice to be appropriate and I have no further recommendations to add.

ii) [RN C]

[RN C] reports reflecting on the care she provided to [Mr A] and making changes to her practice. These include updating her BiPAP knowledge; ensuring appropriate oxygen delivery systems are available and in line with a patient's respiratory needs; and ensuring that she clarifies the aims of a patient's plan of care with the medical team. I consider these to be appropriate.

To avail of all the learning available in this case, I would recommend that [RN C] consistently seek a medical team review of any ward patient who is so restless or agitated that she is providing them with 1:1 nursing care. In addition, I consider that [RN C] needs to amend her clinical practice to ensure that she consistently follows the 'outline of clinical response to EWS

triggers' or ensure that she seeks a medical review of the patient so that the vital sign parameters are changed.

Following a review of [RN C's] further response I have determined no cause to amend the criticisms or level of departure presented in my previous advice.

iii) [RN F]

Following a review of [RN F's] response I remain critical of her failure to act in accordance with the expectations detailed in the Bay of Plenty DHB Adult Observation Chart. If she had, she would have sought a medical review of [Mr A] and increased the frequency of vital sign checks between 12midnight and 4am. [RN F] advises that she balanced the risk of disturbing [Mr A] and maintaining a necessary level of monitoring by checking his respiration rate, oxygen saturations and heart rate every two hours rather than hourly. While I acknowledge that many of my peers would not be critical of this, I consider that they would share my criticism of [RN F's] failure to respond appropriately to [Mr A's] consistent elevated respiration rate and seek a medical review. I acknowledge that [RN F] is correct that [Mr A's] respiration rate had been elevated for approximately 24 hours and the other nurses involved had also not requested a review. While I do not consider such a pattern to justify further poor nursing care, it does mitigate my criticism of [RN F].

In my opinion, [RN F's] failure to appropriately escalate [Mr A's] abnormal vital signs was at a minimum a mild departure from accepted nursing standards.

iv) [RN E]

[RN E]'s further response reiterates the busyness of the shift and that the care of [Mr A] was shared between her and another RN. The Bay of Plenty DHB response — 13 February 2017 — also reports that staffing levels on a night shift are such that a team approach rather than specific patient allocation is favoured. In addition, [RN E] advises that she was also the assigned co-ordinator for this shift.

Following a review of the further relevant responses, I continue to consider that there were periods when the nursing care provided overnight, was inconsistent with expected care of a COPD patient with type 2 respiratory failure and am critical of this. However, I consider that there were factors that facilitated the incidences of suboptimal care and these have mitigated my criticism. While I do not consider that the failures apply solely to [RN E], I am mindful that she was cognisant of [Mr A's] unresponsive state secondary to hypercapnia and the upper limit of desired oxygen saturations.

In my opinion, [RN E]'s failure to ensure that [Mr A] was provided with nursing care consistent with his respiratory needs was at a minimum a mild departure from accepted standards.

5. The adequacy and the appropriateness of the services provided by Bay of Plenty DHB including but not limited to:

   a. Oxygen and BiPAP training provided to nursing staff caring for [Mr A]

   As discussed in 6b of advice dated 27 October 2016, I consider the training for BiPAP and oxygen therapy as detailed in the Bay of Plenty DHB response to be suitably comprehensive and equivalent to that of other DHBs.

   b. The system, processes and policies current at the time of [Mr A's] admission — [2015].

   I have previously reviewed the Clinical Practice Manual Protocol 3.1 Non-invasive ventilation BiPAP/CPAP nursing management and Guidelines doctor's evening handover and have nothing further to add — please refer to previous advice (6a i and 6a iv) dated 27 October 2016.

   I would agree with [RN R] that care of patients requiring oxygen therapy is a core nursing skill that is initially addressed in the undergraduate programme and followed up in subsequent post graduate clinical study days as well as through on-the-job learning. In relation to oxygen delivery systems, Bay of Plenty DHB advises that the Lippincott Nursing procedure manual protocol for the delivery of oxygen therapy was the relevant reference guide available at the time. The Lippincott Procedures is an American publication that is generally viewed as a good, generic nursing guide. Other than in a list of oxygen delivery systems, Venturi masks are not covered but nor is the focus of this guide on patient respiratory conditions. I note that since [Mr A's] death, Bay of Plenty DHB have supplemented the Lippincott oxygen administration section with a tool that identifies appropriate oxygen delivery devices and when such a device is to be avoided. I consider this resource to be an appropriate addition.

6. The adequacy and appropriateness of the steps taken by Bay of Plenty DHB to implement the recommendations made in its internal investigation report, reference #29080.

   Based on the Bay of Plenty DHB response and provided documentation, all identified recommendations have been achieved or a suitable and appropriate alternative to the recommendation has been implemented."