**Care of patient with respiratory failure**
**15HDC00643, 13 December 2017**

*District health board ~ Medical registrar ~ Registered nurse ~ Oxygen therapy ~ Respiratory failure ~ Communication ~ Medical review ~ Right 4(1)*

An 83-year-old man with a history of severe end-stage chronic obstructive pulmonary disease with pulmonary hypertension presented to the Emergency Department (ED) at a public hospital following a referral from his general practitioner, who reported that the man was "feeling terrible" and had an $SpO_2$ of 75%. The man 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, who instructed that the man continue with BiPAP and specified that his $SpO_2$ levels should be maintained between 88–92%. The man was then admitted to the Admissions Planning Unit and transferred to the ward.

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

At 6pm the man was drowsy and his $SpO_2$ was 72%. The house officer reviewed the man and contacted the medical registrar, and a plan was made to move the man to a side room. The senior medical officer was not informed of the man's deterioration. At 9.25pm the house officer specified that the man'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 the man's $SpO_2$ was 98% and, at 10.50pm, a line graph indicates that it was 98–100%. BiPAP was also discontinued by the registered nurse on duty some time after the house officer's review and recommenced in the early hours of Sunday following medical instruction that BiPAP be recommenced.

On Sunday morning, the medical registrar reviewed the man 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, the man's $SpO_2$ was 90%, and this is the last entry in the BiPAP observation chart. The registered nurse who worked the afternoon shift on Sunday recorded in the clinical notes that the man remained critically unwell, was restless, and had desaturated to an $SpO_2$ of 60%. She recorded that the man was not tolerating BiPAP and that she had used a non-rebreather mask alternated with nasal prongs. Throughout the remainder of her shift, the nurse recorded that the man's $SpO_2$ was between 91–92%.

At 10.45am on Monday, the man was commenced on comfort cares and, sadly, he died.

**Findings**

The district health board (DHB) breached Right 4(1) by failing to ensure that the man received an acceptable level of care. It was noted that staff inappropriately utilised oxygen delivery systems; the man was administered oxygen therapy despite his $SpO_2$ levels being higher than the upper limit prescribed by the medical team; nursing staff failed to appreciate that the man 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 the man on BiPAP, or when the man'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.

The nurse on duty on Saturday evening breached Right 4(1) for failing to maintain the man's $SpO_2$ levels within the documented plan and to seek a medical review when she was unable to maintain the man on BiPAP, and for being unaware that the man had been prescribed clonazepam to help him tolerate BiPAP.

The nurse on duty on Sunday afternoon breached Right 4(1) for failing to seek a medical review when the man became hypoxic, and for not managing his oxygen therapy adequately. Adverse comment was also made regarding the nurse's documentation.

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

**Recommendations**

It was recommended that the DHB 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.

It was recommended that the first nurse 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 was also recommended that she 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.

The DHB and the first nurse supplied HDC with an apology letter for the man's family. It was recommended that the second nurse and the medical registrar apologise to the man's family for the failings identified in the report.