



# **CORONERS COURT OF QUEENSLAND**

## **FINDINGS OF INVESTIGATION**

**CITATION:** **Non-inquest findings into the death of Mr K**

**TITLE OF COURT:** Coroners Court

**JURISDICTION:** CAIRNS

**DATE:** 19/07/2024

**FILE NO(s):** 2021/3853

**FINDINGS OF:** Melinda Zerner, Coroner

**CATCHWORDS:** CORONERS: health care related death; chronic obstructive pulmonary disease (COPD); oxygen administration; oxygen saturations; carbon dioxide retainer; interhospital transfer

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## Introduction

1. Mr K was 81 years old and died on 20 August 2021 at a large regional public hospital.
2. A doctor from the large regional public hospital reported Mr K's death to the Coroner because his death was potentially a health care related death within the definition in the *Coroners Act 2003*.
3. The role of a Coroner is to investigate reportable deaths to establish, if possible, the cause of death and how the person died. The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability. An investigation is about attempting to find the root cause of the incident that precipitated the death and in appropriate circumstances to analyse systemic failures that contributed to the death and to design remedial responses.
4. In making my findings, they are based on proof of relevant facts on the balance of probabilities. I am guided by the principles outlined in *Briginshaw v Briginshaw* (1938) 60 CLR 336. That is, I am not able to make adverse findings against, or comments about individuals, unless the evidence provides a comfortable level of satisfaction that they caused or contributed to the death.

## Circumstances of the Death

5. Mr K had a history of chronic obstructive pulmonary disease (COPD) of more than 30 years. Additionally, he had moderate to severe aortic stenosis, pulmonary artery hypertension, general hypertension, and a diagnosis of attention deficit hyperactivity disorder.
6. Mr K was admitted to a residential aged care facility (RACF) on 2 August 2021 following a several week admission to the large regional public hospital for an infective exacerbation (IE) of COPD and delirium. During that admission Mr K was noted to be at risk of type 2 respiratory failure. He was discharged from hospital and his observations on admission to the RACF showed an oxygen saturation level of 86% on room air.
7. Across the month of August 2021, Mr K had relatively unremarkable recordings in the nursing care notes. Two falls were reported, both unwitnessed and mechanical. The first on 14 August 2021 involved Mr K slipping from his bed, injuring his knee and head. Minor injuries were identified, and treatment was provided. Mr K continued to complain of knee pain. A further fall occurred in the afternoon of 17 August 2021. Mr K was assessed by nursing staff and placed on oxygen. He was noted to be drowsy and tired.
8. A General Practitioner (GP) review was organised and a phone order for a non-steroidal anti-inflammatory drug (Mobic) was provided. A phone call between Mr K and his family caused his family to raise concerns about Mr K. As a result, the RACF arranged to transfer Mr K to hospital for further investigation.
9. On 18 August 2021, Mr K was initially admitted to the large regional public hospital. Paramedic observations during transfer to the hospital noted he had a temperature of 37.8 degrees, a heart rate of 115-140 beats per minute, and an oxygen saturation level of 86%. He was described as having dry mucosa and was given 500mL of intravenous normal saline during transit.
10. On assessment at the hospital, Mr K was lethargic. He underwent several

investigations. The impression of the treating team was that he was septic with increased work of breathing.

11. Mr K's family says they phoned the large regional public hospital and asked that Mr K not be administered any opiate medications or Diazepam. This was due to a bad recent experience in hospital, in July 2021, which resulted in a decrease in his level of consciousness (I could not locate any record of this in the clinical record).
12. Mr K was managed for a possible IE COPD with antibiotics and prednisone. Oxygen saturation levels were titrated to 88-92%. After spending the night in the emergency department, Mr K was transferred to the ward. He was clinically stable. The plan was for Mr K to be possibly discharged back to his RACF with antibiotics and ongoing physiotherapy (an x-ray of his knee was unremarkable). Mr K's family spoke with him and found him to be very responsive.
13. On 19 August 2021, Mr K was assessed during the 'Gen Med Team E Ward Round'. The author of the clinical note records,

*Likely mild exacerbation of COPD ?infective given raised CRP and febrile on admission.*

*No clear consolidation on CXR.*

*Overall function decline resulting in multiple falls.*

14. Mr K's oxygen saturations were 95% on 0.5 litres of oxygen via nasal prongs and 90% on room air. Under the heading Plan, the author recorded,

*Should he have further episodes of SOB, please trial salbutamol/Atrovent as first intervention prior to increasing oxygen*

*Aim sats 88-92%*

*Continue Prednisone 25mg PO*

*Dr ### respiratory physician to take over care at private hospital*

*Nurse to check Osat off oxygen in 10 minutes*

*Continue to w/h frusemide today*

15. Mr K was for transfer to a regional private hospital (the private hospital). It is not clear in the records as to why he was to be transferred. However, as planned, he was transferred under the care of a respiratory physician for further treatment. His family says they were told Mr K was being transferred due to bed capacity issues at the large regional public hospital.
16. The admitting doctor at the private hospital noted Mr K's skin turgor being down and that he had a dry tongue. The doctor prescribed intravenous fluids overnight, in addition to the continuation of the other cares. The chart entry indicates an oxygen saturation goal of 86-92% (though this is partially obscured by a sticker, it is reiterated by medical officer review). A nurse records on admission Mr K did not have any oxygen on, two litres per minute via nasal prongs was applied. It was reduced to one litre as his saturations improved to 92%.
17. Mr K's family says when they spoke with Mr K at the private hospital, he was slurring his words and was very confused. She said he sounded very sick and could not talk as he was falling in and out of sleep during her conversations with him.
18. It was noted Mr K had oxygen desaturation episodes when off oxygen, down to ~70% range. Nursing staff would adjust his oxygen level to attempt to keep it in the therapeutic range. Intravenous fluids were commenced at 9.30pm, and Mr K received

5mg of Diazepam at 7.20pm.

19. A nursing entry at 1.40am notes Mr K was agitated and requesting his sleeping tablet. Despite it already having been administered, the nurse agreed to provide a second dose, which was technically available within the PRN (as required) Diazepam order of 5-10mg nocte. The second dose was administered at 10.30pm.
20. Oxycodone was also administered in two separate 2.5mg dosages, one at 7.15pm and the other at 3.25am.
21. A medical officer review occurred at 3.40am. This was due to Mr K having a fall, with a respiratory rate of 30. The resident doctor noted Mr K had oxygen saturations of 98%, blood pressure of 148/95, and a heart rate of 120. Mr K was confused with an altered Glasgow Coma Scale (GCS) [measures a patient's level of consciousness]. The doctor reiterated the recommended oxygen saturation target was at a level of between 88-92% and suggested an arterial blood gas should be taken.
22. The timeline of events from the progress notes is somewhat difficult to establish as nursing and medical entries appear separate and are not all contemporaneous.
23. The nursing entry concerning the fall was made at 4.30am. Mr K was found on the floor under a table near the window. He was bleeding from a superficial laceration on the back of his head. His oxygen saturations were 72% on room air. He had an elevated pulse and respiratory rate. Mr K was becoming agitated saying 'I can't close my eyes'. The nurse records, "*Pt was saturating 100% on 4L via Hudson mask, tritiated down to 2-3L via NP. Pt in bed ATOR (At time of report) being specialled, to comfort patient*".
24. Mr K was administered 2.5mg of subcutaneous Morphine at 4.10am and again at 4.40am. This was prescribed by the resident medical officer who had reviewed Mr K following his fall.
25. In reviewing the observation chart, Mr K's oxygen saturations between 4pm and 12.50am ranged from 69% to 98%, with oxygen administered via nasal prongs at 1-2 litres per minute. At 3.15am they decreased to 69% wherein oxygen via nasal prongs at 3 litres per minute were applied. At 3.35am a Hudson mask was applied at 4 litres per minute which brought Mr K's oxygen saturations up to 100%. At 5.30am his oxygen saturation was recorded as 96% with 3 litres of oxygen via nasal prongs, and at 8.55am his oxygen saturations were again at 100% with 3 litres of oxygen via nasal prongs.
26. An arterial blood gas result is recorded at 5.13am demonstrating a pH of 7.194 with a carbon dioxide level of 94mmHg, a result consistent with respiratory acidosis. The bicarbonate level was measured at 36mmol/L indicating chronic kidney compensation for respiratory acidosis.
27. Though it is not clear in the notes from the private hospital, it was decided to transfer Mr K back to the large regional public hospital due to his unstable condition and his delirium, which required increased nursing support.
28. Mr K's family spoke with a nurse from the private hospital. They asked if he had been given opiates and Diazepam. The nurse confirmed he had. Mr K's family advised the nurse they had told the large regional public hospital not to give him those drugs because of what happened to him during his previous admission.
29. On his readmission to the large regional public hospital, Mr K was intermittently conscious and lucid. The working diagnosis was ongoing IE of COPD with the addition

of type 2 respiratory failure thought to be related to the administration of excessive oxygen and the administration of respiratory depressing medications (Diazepam, Oxycodone and Morphine referred to above).

30. On admission, Mr K's pH was 7.3 with a carbon dioxide level of 68mmHg (improved but still abnormal). Mr K's prognosis was considered quite guarded, and in consultation with his family it was decided to trial reversal agents and bi-level positive airway pressure ventilation. This was somewhat successful, with a brief improvement in Mr K's level of consciousness. He requested not to have an oxygen mask while lucid and in consultation with his family, a decision was made to provide Mr K with comfort cares. He passed away at 8.40pm.

### **Forensic Medicine Review**

31. I have been advised, the bodies usual manner of controlling oxygen levels is by measuring carbon dioxide levels (and acidity associated with this) in the blood. In persons with significant lung disease, this mechanism can be damaged, with the brain subsequently relying on oxygen levels directly to determine breathing rate. This mechanism has two issues, it is slow to adjust levels and in cases of oxygen being delivered to the person, the breathing drive will not take into consideration a building carbon dioxide level, leading to retention of carbon dioxide and acidosis of the blood.
32. A Forensic Medicine doctor was asked to review Mr K's case. He has advised, given Mr K's severe COPD, there is a concern regarding the care administered to Mr K. He states,

*The decision to provide further diazepam as well as the provision of oxycodone, combined with oxygen provision (with multiple readings close or at 100%) is highly probable to have contributed to [Mr K's] type 2 respiratory failure. Additionally, the provision of intravenous fluids to a man with a combination of aortic stenosis, pulmonary hypertension and COPD while being normotensive is ill-advised and may have also contributed to respiratory failure, with physical examination the morning of 20th indicating possible fluid overload.*

33. The doctor has acknowledged Mr K's overall prognosis was poor prior to his admission to hospital and says it is probable that even with perfect management over 19 and 20 August 2021, Mr K was at risk of dying because of his infective exacerbation of COPD. He states, "*the recovery in Mr K's pH at CBH and improvement with naloxone/BiPAP as well as the decision to actively palliate make the death consequent to the overnight events less likely*".

### **Regional Private Hospital**

34. I made enquiries with the private hospital. I understand Mr K was admitted under the public/private 'winter bed agreement'.
35. At the outset, the private hospital advised Mr K was too unwell to have been transferred to the rehabilitation ward. The nurse unit manager did not receive a clinical handover from the transferring ward at the large regional public hospital. They say they had no knowledge of his clinical status or current plan on his arrival to the hospital. However, this is not consistent with the clinical record as it includes a copy of the large regional public hospital records, and a draft Discharge Plan. There is no reference to Mr K being a CO2 retainer on the discharge plan.

36. An incident form had been completed by the private hospital at the time, the author records,

*Patient arrived at the Rehabilitation ward at 1600hrs via ambulance, brought up via wheelchair once patient was in bed Patient appeared extremely short of breath (no oxygen had been administered during transfer). Observations taken oxygen 77% on room air. HMO notified and Patient placed on 2L of oxygen via NP – Oxygen saturation rechecked 96%. Nurse check notes from the large regional public hospital. Patient should be on Oxygen 0.5L. Oxygen decreased to 1L Oxygen saturation rechecked 92% and HMO Reviewed.*

37. Mr K had two falls following his admission to the private hospital. On each occasion he had removed his oxygen and his oxygen saturations dramatically fell. On the morning of 20 August 2021 at 7.45am, it was decided by the treating doctor that Mr K was too unwell for admission to the hospital.
38. The transfer note records, 'Unsuitable step down patient, end stage COPD, declining condition'.
39. As a result of the communication issues concerning the transfer of Mr K, on 6 September 2021, the private hospital developed a new ISBAR (assessment tool) handover transfer form to record clinical handover from external transfers in and out of the hospital. The form remains in use.
40. An investigation was completed into Mr K's admission and subsequent death. Several documentation discrepancies were noted, they include:
- Acute Resuscitation Plan by the medical officers did not match the plan implemented by another doctor.
  - No patient admission form had been completed on admission.
  - No cognitive delirium screen was completed on admission.
  - Falls risk completed score low and then this was crossed out and the score was increased due to the two falls Mr K had.
  - No written impression of diagnosis of Mr K being a CO2 retainer in the private hospital notes, only one reference to this in the large regional public hospital notes.
41. I have received a statement from the Director of Clinical Services at the private hospital who has been in the role since 1 August 2020. She was not directly involved in Mr K's care but has provided a response to a series of questions I posed to the private hospital. She has advised:
- Mr K had some lower back pain following his first fall at or around 6.20pm. When he was reviewed by a medical officer, he was prescribed Diazepam 5-10mg as required, and Oxycodone 2.5mg four hourly as required in response to Mr K's pain. This is consistent with the previous orders made by staff at the large regional public hospital, which indicate Mr K had been prescribed Endone 2.5mg three hourly as required, and a stat dose of 10mg of Diazepam on 18 August 2021.
  - Once Mr K had recovered from his transfer and arrived with an oxygen

saturation of 77%, he was to have his oxygen titrated between 88-92%. Attempts were made to titrate his oxygen level based on Mr K's fluctuating condition.

- c. When Mr K fell at 3.35am, his oxygen saturations were only 72%, and as a result an oxygen mask was applied. Mr K was agitated and had pulled out his intravenous cannula. The nurse recalls she may have continued to administer the oxygen via a mask as Mr K would not keep the nasal prongs on. At 5.20am, the oxygen had been changed back to nasal prongs with his oxygen saturation recorded at 96%.
  - d. Following the fall, Mr K had a respiratory rate of more than 30. A plan was documented in the progress notes which included the patient was for arterial blood gases, to titrate O<sub>2</sub> to SpO<sub>2</sub> 88-92% and for subcutaneous morphine. The indication for the morphine was shortness of breath or pain.
  - e. There were no further recordings of oxygen saturations between 5.30am and 8.55 am.
  - f. In the progress note at 1.35pm, it was noted Mr K's oxygen saturation was 88% on 2 litres of oxygen. He was restless in bed. [This seems to have been a retrospective entry as Mr K arrived at the large regional public hospital ED at 10.16am]
42. I note the arterial blood gases taken at 5.13am was when Mr K had oxygen at 3 litres per minute in place. The PCO<sub>2</sub> was significantly elevated at 94, compared to 59 on 18 August 2021 at 1.27am. The arterial blood gas report was not available until 9am. His CO<sub>2</sub> on arrival to the large regional public hospital was 89.
43. I have been advised Mr K's case did not raise any queries regarding the administration of oxygen in COPD patients at the private hospital.
44. It is acknowledged the public bed section was set up in the Rehabilitation ward to provide overflow beds to the local public health service to alleviate bed pressures during those busy months. I have been advised,

*The Accredited Practitioners who admit patients to [the private hospital] are familiar with the services that [the private hospital] is licensed to provide and are aware of the skill level of the medical officers and nursing staff on the rehabilitation unit. The hospital medical officers work closely with the Accredited practitioners. All incidents and the investigation outcome are shared at the M&M meetings, for accredited practitioners to review. Recruitment and staff mix is shared with the accredited practitioners at M&M meetings.*

*The nursing team in the rehabilitation unit are experienced in the administration of oxygen to respiratory patients, however some of the nursing staff may not possess advanced respiratory management skills.*

45. I have been advised the rehabilitation team may benefit from some training on advanced management of respiratory patients. This is to provide them with the knowledge and competency to care for patients with end stage COPD, and CO<sub>2</sub> retaining patients in the future. I have been assured the private hospital will organise this training for its staff.



## Response from the Public Health Service

46. The health service commissioned a Clinical Care Review into Mr K's death. A report was produced and signed off by the Chief Executive on 4 February 2022.
47. On 3 March 2022, an Open Disclosure Meeting occurred with Mr K's family. An apology was provided for the events leading to Mr K's death. Mr K's family were informed of the Clinical Care Review and the outcome of the review.
48. At the time Mr K was admitted to the ED from the RACF, there was an agreement between the private hospital and the health service as to specific acute diagnostic related groups (a standard classification system of diagnoses). Mr K's diagnostic group was 'E65B: Chronic Obstructive Airway Disease: minor complexity'. This was a DRG which had been agreed between the hospitals.
49. When Mr K arrived at the ED, the large regional public hospital was in 'Code Yellow' which indicated patients who were stable could be transferred to a private facility or a step-down facility to allow patient flow and to increase bed capacity. This was pursuant to the Demand Management and Escalation Procedure 2020. The process highlights the safety of patients as the primary consideration in the management of patient flow.
50. The clinical reviewers and health service have acknowledged, Mr K had a poor pre-morbid state and was at a high risk of acute deterioration and mortality, and was not an appropriate patient to be transferred to the private hospital. The author of the report states,

*Overall, whilst [Mr K] was stable at the time of transfer, the review determined that [Mr K] was not suitable for transfer to [the private hospital] due to his very recent overall health decline putting him at a high risk of further deterioration at the time of transfer to [the private hospital].*

51. The author of the clinical review surmised the reason for transfer may have been because Mr K had been identified as being for discharge the day prior and had been stable overnight. That is, he did not have shortness of breath or hypoxaemia. This likely led to the decision by the relevant decision makers that he was suitable for transfer to the private hospital.
52. In addition, the reviewers identified,
  - a. The health service Oxygen Therapy Administration procedure does not require the identification of Carbon Dioxide retainer patients on all Oxygen medication charts.
  - b. The interhospital transfer (IHT) request form did not reflect Mr K's high risk of hypercapnic respiratory failure nor the management plan for COPD related symptoms.
  - c. There was no consultant-to-consultant hand over for Mr K's transfer of patient care.
  - d. There was no formal health service procedure to outline the referral process and referral criteria for the transfer of patients to the private hospital.

### *Improvements since Mr K's death*

53. The author of the review recommended the health service amend and implement the 'Oxygen Therapy Administration (ADULT)' procedure and audit tool to ensure all patients who are Carbon Dioxide retainers are clearly identified on all oxygen therapy administration medication orders and to make the oxygen prescription sticker mandatory for all oxygen therapy administration medication orders.
54. I have been provided with a copy of the revised documentation and evidence to support an appropriate education and communication plan was implemented concerning the amended procedure.
55. The health service has reviewed its Inter Hospital Transfer Procedure. It outlines the referral process not only for critically ill patients, but also for transfer between public hospital facilities and non-Queensland health facilities, for example, the private hospital. It sets out the minimum transfer documentation required, including but not limited to a Patient Checklist.

### **Follow up with the Private Hospital**

56. I sought further information from the private hospital regarding its policies and procedures concerning oxygen administration. This was to see if they had updated their procedure or whether they had a similar policy as the health service. I was advised the private hospital did not have such a procedure.
57. In response, the private hospital undertook a review of its Oxygen Therapy Policy and Guidelines locally and escalated the issue to a Governance team, to look at nationally. They also contacted the public health service team to look at the oxygen prescription stickers and will be including those in their review of Policy and Guidelines.
58. On 18 June 2024, the private hospital provided me with an 'Action Plan'; a snapshot of the NSQHS Gap Analysis; and a new oxygen administration policy which is currently being trialled. The draft policy is comprehensive. A non-emergent patient now requires a prescription for oxygen, and the special precautions required for a COPD patient are set out.

### **Forensic Pathologist Examination**

59. An external autopsy and an internal autopsy to the extent necessary to identify the cause of Mr K's death was ordered.
60. The forensic pathologist noted Mr K's respiratory condition. Toxicology revealed several drugs but all below the potential lethal level. The forensic pathologist states,

*In my opinion, at the time of autopsy, the cause of death was most probably the combined effects of severe chronic lung disease on a background of atherosclerotic cardiovascular and valvular heart disease, but the possibility of concurrent drug toxicity and the potential of inadvertent administration of excess oxygen and/or sedatives were difficult to exclude or confirm at autopsy. Further investigations were subsequently performed.*

*Microscopic examination showed severe lung scarring, heart muscle, kidney and liver scarring.*

*Testing for drugs and poisons showed the presence of pain killers (oxycodone, morphine and metabolites), sedatives (diazepam, nordiazepam), stimulant*

*(amphetamine), and a sedative anaesthetic agent (midazolam), all at blood levels below the reported respective potentially individually lethal ranges. No other drugs, including alcohol, were detected. Although none of the individual medications and substances identified on toxicological analysis was at a level sufficiently high to result in death in isolation in a normal subject, the potential contribution of sedative agents on a background of critical chronic lung disease (particularly earlier in his final admission) is difficult to quantitate, and it remains possible that there may have been more-than-additive accentuation of the respiratory depression associated with multiple sedative agents in this particular instance.*

61. The forensic pathologist concluded the cause of Mr K's death was chronic lung disease.

## **Conclusion**

62. After considering the material obtained during the coronial investigation, I consider I have sufficient information to make the necessary findings in relation to Mr K's death.

63. Mr K was suffering severe COPD and had multiple medical co-morbidities. He became unwell requiring transfer from his RACF to the large regional public hospital. Unfortunately, Mr K was inappropriately transferred to the private hospital. There were deficits in his management concerning his oxygen administration and the prescription and administration of respiratory depressant medications at the private hospital. This is reflected in his arterial blood gas at 5.13am. It is not possible to establish with any certainty if this caused or contributed to Mr K's death given his severe lung disease, atherosclerotic cardiovascular and valvular heart disease. However, I consider on balance it is likely those events hastened the decision to commence palliation measures for Mr K.

64. I am satisfied the large regional public hospital and the private hospital have taken steps to improve their care of patients requiring oxygen therapy. Further, I am satisfied steps have been taken by the large regional public hospital to improve communication for its inter-hospital transfer processes.

65. I consider, if it has not already been adopted, other healthcare providers may like to consider a process which ensures all patients who are Carbon Dioxide retainers are clearly identified on all oxygen therapy administration medication orders and to make an oxygen prescription sticker mandatory for all oxygen therapy administration medication orders. This is an obvious visual cue for all clinicians when they are considering the prescription and administration of respiratory depressant medications and the adjustment of oxygen therapy to a patient who is a Carbon Dioxide retainer.

66. I accept the forensic pathologist's opinion as to the cause of death.

67. I extend my condolences to Mr K's family and friends for their loss.

68. I have sought the consent of Mr K's family to publish a de-identified version of these findings so other health care providers can reflect on their practices concerning oxygen administration to a COPD patient.

**Findings required by s. 45**

**Identity of the deceased –** [de identified]

**How he died –** Mr K was a frail, elderly man with severe lung disease, atherosclerotic cardiovascular and valvular heart disease. Mr K likely died due to a combination of his lung disease and deficits in the management of his oxygen administration and the prescription and administration of respiratory depressant medications.

**Place of death –** Large Regional Public Hospital

**Date of death–** 20/08/2021

1(a) Chronic lung disease

2 Atherosclerotic cardiovascular disease; Valvular heart disease

I close the investigations.



Coroner  
21 June 2024