QUEENSLAND COURTS

CORONERS COURT OF QUEENSLAND

FINDINGS OF INVESTIGATION

CITATION:	**Non-inquest findings into the death of RR**
TITLE OF COURT:	Coroners Court
JURISDICTION:	BRISBANE
DATE:	12/04/2018
FILE NO(s):	2016/2167
FINDINGS OF:	Ainslie Kirkegaard, Coronial Registrar
CATCHWORDS:	CORONERS: health care related death; admission for inpatient bowel preparation for surveillance colonoscopy; admission to outlying ward; failure to recognise & escalate intolerance to bowel preparation; lack of documentation by ward call doctors; clinical guideline for inpatient bowel preparation

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RR was an 86 year old man who died at a tertiary public hospital on 29 July 2015 during admission for an elective surveillance colonoscopy and biopsy of suspected bowel cancer recurrence.

RR's death was reported to the coroner on 31 May 2016 after internal mortality review identified concerns about Mr RR's clinical management which may have contributed to the death.

RR's admission to hospital

Review of RR's hospital records shows he had a history including adenocarcinoma of the caecum/ascending colon with subtotal colectomy 2014 and paroxysmal atrial fibrillation (untreated).

RR was to undergo colonoscopy to investigate recent abdominal pains and the finding of a palpable mass in the right lower quadrant of his abdomen. Colonoscopy is generally an outpatient procedure. However given his age and because he lived alone, RR was admitted to hospital early on 27 July 2015 for administration of bowel preparation for colonoscopy the next day.

He had pre-admission bloods taken on 22 July 2015 which indicated impaired renal function and abnormal liver function tests.

RR arrived at the hospital's Transit Care Hub at 11:30am on 27 July 2015. He was admitted by the gastroenterology intern at 1:00pm. The intern noted that RR had on and off colicky abdominal pain since the cancer was diagnosed in February 2014, which had increased over the past 2-3 days. He had a decreased appetite and nausea but no vomiting. On examination his chest was clear, heart sounds dual but irregular (he had a history of untreated atrial fibrillation), no peripheral oedema and his abdomen was soft and non-tender. His observations were respiratory rate 22, oxygen saturations 100% on room air, temperature 35.5, blood pressure 94/55 and heart rate 100 beats per minute.

There is no reference in the admission notes to the results of the pre-admission bloods or any repeated bloods prior to the bowel preparation administration.

RR was admitted to the Extended Stay Unit at 5:00pm after waiting for 6.5 hours in the Transit Care Hub. Patients admitted for routine colonoscopies are considered less acute and lower risk by the hospital's Bed Management team and were out-lied to available beds hospital-wide. The Extended Stay Unit was one such outlying ward for bowel preparation administration.

RR's observations were recorded as respiratory rate 24, oxygen saturations 98% on room air, temperature 35.9, blood pressure 125/80 and heart rate 57.

As RR was nauseous, he was given 4mg intravenous ondansetron at 5:10pm before the bowel preparation was commenced. The nursing notes document that the gastroenterology intern was informed about this; there is no note from the intern in the chart.

The bowel preparation was commenced at 5:30pm (when it had been ordered for 2:00pm). RR is noted to complain of mild abdominal pain (2-3/10 intensity) and given 5mg oxycodone (Endone, given orally) at 7:00pm.

Nursing staff documented that RR had had a small vomit of approximately 40ml and was given another 4mg intravenous ondansetron at 7:10pm with “minimal effect”. RR also complained of pain and was given 5mg oxycodone (Endone, administered orally) which he vomited up immediately. The Surgical Ward Call doctor was notified and ordered 10mg intravenous metoclopramide (Maxolon, anti-emetic), given at 7:45pm and another 5mg oral Endone, given orally at 8:15pm and to continue with the bowel preparation. There is no medical entry in the chart regarding this intervention.

RR is noted to have opened his bowels (medium, not loose or clear) and the bowel preparation continued.

There is a note made at 1:35am that nurses had contacted Surgical Ward Call who gave a phone order for 10mg intravenous Maxolon, given at 1:45am.

RR is noted to have completed the first jug of bowel preparation at around 2:30am. He received a total of 3L and is noted to have vomited multiple times.

At 4:20am nurses documented that RR had dark coloured vomit and that Surgical Ward Call was notified and ordered 4mg intravenous ondansetron, given at 4:00am. It is noted that “*ward call rv’d [reviewed] patient. Happy with soft abdo and to notify again if any changes. Ward call viewed vomit*”. This suggests that the Ward Call doctor viewed and possibly examined RR although there were no accompanying notes from the doctor to verify this.

Nursing staff documented that RR continued to vomit ‘dark vomit’ after being given ondansetron. A Renal Ward Call doctor was contacted and gave a phone order for a further 4mg intravenous ondansetron, given at 5:05am. It is noted that “*ward call happy that patient is not in pain*”. Again there was no documentation by the ward call doctor.

At 6:50am a Renal Ward Call doctor reviewed RR noting that the Surgical Ward Call had reviewed him earlier in the evening. It was noted that to this point he had received 16mg ondansetron + 20mg Maxolon. On examination the Renal Ward Call doctor noted that RR had no abdominal pain and his nausea and vomiting were settling; his bowels had opened. Observations were documented as pulse 84, blood pressure 120/80, respiratory rate 18, abdomen soft with bowel sounds present and chest was clear. The impression was of “*nausea and vomiting settling; no acute abdomen; haemodynamically stable*”.

RR was seen on the Gastroenterology ward round at 8:45am when he was noted to have a low blood pressure (94/55), pulse 70-80, high respiratory rate (36) and reduced oxygen saturations (90% on room air). He had widespread crackles on his right mid zone and lower lung fields. The impression was that he had aspiration pneumonia and bloods/chest X-ray were arranged urgently. At 9:10am he went into a rapid atrial fibrillation heart rate of 160 beats per minute. Urgent cardiology review was obtained.

RR was then transferred to the Coronary Care Unit at 11:30am and commenced on amiodarone and heparin infusion under cardiac monitoring. Chest x-ray confirmed aspiration and he was commenced on broad spectrum antibiotics (Piptaz). He was noted to develop an acute renal injury with rapid rise in creatinine and no urine output despite adequate intravenous fluid infusion. On discussion with RR and his health attorneys it was decided that he would not wish to be managed in intensive care, be defibrillated or ventilated. He was continued on intravenous fluids, appropriate antibiotics, high flow nasal oxygen and rate control measures (digoxin) for his atrial fibrillation. He died at around 7:00am the next morning, 29 July.

The treating team issued a cause of death certificate attributing the death to aspiration pneumonia secondary to recurrent colorectal cancer, with atrial fibrillation noted as a significant contributing condition. RR's death was not reported to the coroner at this time.

The hospital's internal clinical review outcomes

The circumstances of RR's death were initially reviewed by the hospital's Director of Cardiology who recommended review by the Gastroenterology Department. The admitting consultant gastroenterologist contributed to this process and was highly critical of RR's management by the ward call doctors overnight on 27-28 July 2015. She identified a range of issues she considered could possibly have prevented the aspiration and death including lack of appropriate and timely medical review, failure to recognise a deteriorating patient or possible signs of gut obstruction, failure to refer to a senior person such as medical registrar or gastroenterology consultant on-call and "over-the-phone" prescribing of large amounts of anti-emetic without examining the patient.

The hospital's subsequent formal clinical review identified the following contributory factors and corresponding recommendations:

1. Delay in commencing bowel preparation administration

RR remained in the Transit Care Hub for 6.5 hours, meaning his bowel preparation was not commenced until after 5:00pm.

The review team recommended a Patient Flow review of the admission process in the Transit Care Hub for patients awaiting an inpatient bed for bowel preparation administration with a view to facilitating these admissions to the inpatient unit by 3:00pm.

2. Patient not admitted to home ward

The review team acknowledged clinical evidence suggest being treated within the ward of the relevant specialty is beneficial and care outside this area may be compromised. It was noted that the hospital makes every effort to admit patients within the specialty units and efforts had been made in the past to mitigate the risk associated with being an out-lied patient. However, due to bed availability this does not always occur.

RR's bowel preparation was administered in an outlying ward by staff not familiar with administering bowel preparation.

The hospital's Bowel Preparation Quality data is reported on monthly for both inpatient and outpatient cohorts. The review team noted this data indicates patients who receive bowel preparation as outpatients were having better results for quality of preparation than the inpatient cohort. Analysis of data from July-December 2015 revealed that 78% of patients undergoing colonoscopy were outside the home ward and that preparation was done poorly in 15% of all inpatient endoscopy cases. As a result, the Endoscopy Unit were delivering in-service sessions to nursing staff hospital wide about how to ensure successful bowel preparation.

The review team identified that patients admitted for colonoscopy preparation are more complex and at greater risk of poor bowel preparation than patients taking bowel preparation at home. These patients were not routinely admitted to the home ward due to increasing patient acuity of patients in the home ward and the number of patients requiring admission

under the gastroenterology team.

3. Absence of nursing and medical guidelines for inpatients receiving bowel preparation administration

At the time of the clinical review, there were no inpatient procedures available online for clinicians caring for patients receiving bowel preparation outlining the risks and expected pathway.

At the time of RR's admission, patients received written information which was kept with them pre-and post-procedure. It was not clear whether RR's patient education material was with him at the time.

The review team recommended the development of a clinical guideline for the inpatient administration of colonoscopy bowel preparation, to incorporate an escalation process when administration deviated from the expected pathway.

I have since been provided with a copy of the hospital's guideline for Patient Bowel Preparation Prior to Colonoscopy. This document helps clinicians identify types of patients who may require specific monitoring or variation of care while receiving bowel preparation; sets out the risks and precautions; clearly defines the responsibilities of medical officers and nursing staff; and sets out the steps nursing staff are to take if a patient is not tolerating the bowel preparation – these include seeking medical advice by notifying the gastroenterology registrar or Renal Ward Call and stopping the administration for 30 minutes if the patient develops severe pain.

4. Bowel preparation continued to be administered despite RR vomiting multiple times

The review team identified that Ward Call resident doctors were contacted five times from the time of RR's admission to the Extended Stay Unit at 5:00pm on 27 July to 6:50am the following morning. Four different resident doctors were contacted overnight by the nursing staff about RR's nausea and vomiting. There was no documentation for two of these resident reviews in the progress notes, rather the reviews were identified by nursing documentation and medication prescriptions.

RR continued to vomit despite receiving anti-emetics yet the bowel preparation continued. Administration was not ceased when RR showed signs of intolerance and nor was he identified as being at risk of aspiration.

5. Failure to escalate for senior medical officer review

RR's condition was not escalated to a senior medical officer despite his deviation from the expected pathway.

The review team acknowledged that failure to escalate clinical deterioration had already been identified as an area for improvement within the hospital with targeted education being delivered to interns on the appropriate actions to take when a patient is not following a normal course or deviates from planned course.

The review also identified several sets of observations which should have but did not trigger appropriate actions. RR's low blood pressure (94/55) and his elevated heart rate (109) on admission should have triggered increased frequency of observations and notification to the

treating team during his stay in the Transit Care Hub. Two of the sets of observations taken between 8:40am and 9:00am on 28 July met Rapid Response Team code criteria but no Code Blue was called.

The review team noted that the alert system for deteriorating patients that was at that time part of the paper observation chart now forms part of the hospital's electronic medical record. This system operates to generate an alert on the screen when a patient's vital signs fall outside the pre-set thresholds and is only removed when the observations fall into normal range. This is supplemented by a pop-up alert indicating a code red alert or a code yellow alert. The review team noted online education has been provided to all clinicians outlining the alerts, actions to take and altering the call criteria appropriately.

Independent clinical review

I arranged for an independent doctor from the Department of Health Clinical Forensic Medicine Unit to review the patient record and advise whether there may have been an opportunity to have prevented RR's death.

The reviewing doctor advised if the examination performed at 6:50am on 28 July is accepted as correct, then there was no real reason to suspect that RR had developed a gut obstruction or possible aspiration. This is the only objective evidence available – however, the reviewing doctor was concerned that the examination results seemed a bit incongruous with events preceding it and the catastrophic events some two hours later and beyond.

Once RR was assessed on the gastroenterology ward round at 8:45am that morning, the diagnosis was established and mechanisms put in place to address possible aspiration. The reviewing doctor had no concerns regarding treatment thereafter which was swift and appropriate.

Statements from the Surgical Ward Call doctor, the Renal Ward Call doctor and nursing staff responsible for RR's care on 27-28 July 2015

I sought statements from the medical officers and nurses involved in RR's care over 27-28 July which provided some further clarity about his management over this period.

RR was reviewed by the gastroenterology intern on admission. She performed a routine examination and charted him for bowel preparation as per the clinical protocol, as well as routine "as needed" analgesia and anti-emetics.

The gastroenterology team were aware of his abdominal pain and nausea, prior to the administration of the bowel prep. RR received 4mg intravenous ondansetron for nausea at 5:10pm. His nausea and vomiting stopped at 5:30pm and he received magnesium citrate dissolved in 250ml and three Bisacodyl tablets.

At 6:00pm, he was commenced on Glycoprep dissolved in 3L which he finished taking overnight.

He was given 5mg Endone for pain at 7:00pm but he vomited it immediately and was then given 4mg intravenous ondansetron for the vomiting. RR continued to experience nausea and pain.

The intern was contacted by a nurse several hours after admission and told RR was experiencing some nausea but was otherwise well. The intern asked that he be given the ondansetron she charted on admission to help settle his nausea. He was given 8mg

ondansetron (intravenously) and 5mg endone as result. The intern did not attend and examine him as the information she was given suggested he was stable at that time. She had no further involvement in RR's care.

Dr F was rostered on Surgical Ward Call on the evening of 27 July 2015. He was contacted by nursing staff while he was in the Surgical Care Unit and asked to review RR for abdominal pain and one episode of vomiting. Dr F said he examined RR briefly noting his abdomen was not distended and he was opening his bowels. He was not febrile and had no oxygen desaturations. Dr F prescribed 10mg Maxolon as RR had already received 8mg ondansetron, and a further 5mg endone. He said he did not document his examination of RR due to "*significant time pressures of the Surgical Ward Call role*". He said he told nursing staff that as a gastroenterology patient RR should be covered by Renal Ward Call. Dr F states he had no further involvement in RR's care.

RR continued to have nausea and vomiting overnight prompting the nurses to notify Night Surgical Ward Call who ordered a further 10mg metoclopramide and 4mg ondansetron.

The nurse responsible for RR's care on the night shift recalls obtaining a phone order from a medical officer at around 1:35am and although she could not recall exact times, said a medical officer was contacted a further two times during the night shift. The nurse's documentation indicated the medical officer she spoke with was aware of RR's vomiting and approved the administration of anti-emetics.

It is not known which Ward Call doctors, other than Dr F, were contacted overnight.

Nursing staff contacted the Renal Ward Call doctor, Dr W, at around 5:00am on 28 July and told her RR was still feeling nausea and vomiting. Dr W advised the nursing staff to give him another 4mg ondansetron and that she would attend to review him.

Dr W reviewed RR at around 6:50am at which time he told her his nausea and vomiting were settling down. He had opened his bowels overnight. She said he denied having any abdominal pain, cardiorespiratory symptoms or urinary symptoms. His vital signs were noted be stable and his cardiorespiratory examination was unremarkable suggesting he was hemodynamically stable. Dr W was satisfied he showed no features of an acute abdomen and although he had significant nausea and vomiting overnight, it was settling. Dr W advised the nursing staff to give RR more anti-emetics if he had further nausea and vomiting. She also ordered bloods and urine tests. These samples were collected at 7:15am.

The blood test results became available at around 8:00am by which time the gastroenterology team were available and notified of RR's renal function (acute kidney injury).

The Director of Gastroenterology provided a statement which helpfully explained the risks associated with bowel preparation and measures taken by the hospital to address them.

He explained that the department's audit of the severity of gastrointestinal symptoms occurring during bowel preparation demonstrated that abdominal symptoms were reported by 69% of patients suggesting that some degree of symptoms (such as nausea or fullness) are 'normal' when the bowel preparation is consumed. The audit also demonstrated a significant association between the intensity or number of symptoms reported and the bowel preparation outcome, namely patients who had good quality bowel preparation had significantly more severe abdominal symptoms.

As noted by the clinical review, the data shows that patients requiring inpatient bowel preparations had overall poorer quality bowel preparation, this being found to be due to specific medications, for example opioidergic medications, being risk factors for poor bowel

preparation. Patients admitted for bowel preparation have multiple comorbidities and many of them are on pain medications which are a risk for poor bowel preparation.

The Director of Gastroenterology was satisfied that RR's planned colonoscopy was clinically indicated. He explained that all patients at the hospital are assessed by a physician prior to the procedure and the consent in order to ensure there are no contraindications for the procedure or potential drug-to-drug interactions.

He considered that RR's death emphasises that even the 'low risk bowel preparation' can have adverse outcomes in aged, multi-morbid patients.

The Director of Gastroenterology acknowledged that on admission RR's heart rate was increased and his blood pressure was low and considered in retrospect, it would have been more appropriate to investigate this further and potentially abandon the colonoscopy. He acknowledged that the circumstances of RR's death have alerted the department to not only put more emphasis on proper patient selection for colonoscopy or procedural quality indicators but also on the thresholds when planned procedures are postponed or even cancelled due to subtle changes of the health status in older, fragile patients.

Findings required by *Coroners Act 2003*, s. 45

Identity of the deceased: [de-identified for publication purposes]

How he died: RR died from complications of bowel preparation administration which he was receiving as an inpatient. These complications arose because of a failure to recognise he was not tolerating the bowel preparation and was at risk of aspiration. Despite the efforts of nursing staff to seek medical advice about his ongoing vomiting overnight, multiple junior Ward Call doctors failed to escalate RR for senior medical officer review and allowed the bowel preparation administration continue. I am satisfied that the tertiary public hospital has undertaken a comprehensive review of RR's management and implemented appropriate changes, including a clinical procedure to guide Patient Bowel Preparation Prior to Colonoscopy, to minimise the risk of adverse outcomes in what is generally considered to be a low risk health care intervention.

Place of death: A tertiary public hospital

Date of death: 29 July 2015

Cause of death:
1(a) Aspiration Pneumonia
1(b) Recurrent Colorectal Carcinoma
2 Atrial Fibrillation

I close the investigation.

Ainslie Kirkegaard
Coronial Registrar
CORONERS COURT OF QUEENSLAND
12 April 2018