

Regulation 28: REPORT TO PREVENT FUTURE DEATHS (1)

NOTE: This form is to be used **after** an inquest.

REGULATION 28 REPORT TO PREVENT DEATHS

THIS REPORT IS BEING SENT TO:

- 1 Simon Stevens, Chief Executive Officer, NHS England
- 2 Medical Director, North West Anglia NHS Foundation Trust
- 3 Royal College of Anaesthetists
- 4 The Difficult Airway Society

1 CORONER

I am Sean Horstead, Assistant Coroner for the area of Cambridgeshire and Peterborough.

2 CORONER'S LEGAL POWERS

I make this report under paragraph 7, Schedule 5, of the Coroners and Justice Act 2009 and regulations 28 and 29 of the Coroners (Investigations) Regulations 2013.

3 INVESTIGATION and INQUEST

On 07/07/2016 an investigation was commenced into the death of Peter Ian SAINT aged 71. The investigation concluded at the end of the inquest on 23/10/2017. The conclusion of the inquest was:

Medical cause of death:

- 1a Hypoxic / ischaemic brain damage following oesophageal placement of endotracheal tube;
- 1b General anaesthesia for knee replacement surgery.

There was a narrative conclusion that Mr Saint *"died from extensive hypoxic brain damage sustained when deprived of effective lung ventilation after an endotracheal tube was located in his oesophagus for a period of some 25 minutes whilst under general anaesthetic for routine knee replacement surgery."*

4 CIRCUMSTANCES OF THE DEATH

On the 23rd June 2016 Peter Saint, a 71 year old man was admitted to Hinchingsbrooke Hospital, Cambridgeshire for routine elective knee replacement surgery. General anaesthesia was administered at around 15.00 hours. Between 15.40 and 15.45 hours there was a progressive fall in Mr Saint's arterial oxygen saturation and an increase in ventilation pressure. At the removal of the laryngeal mask airway gastric fluid was expelled; the operating table was tilted head down, suction applied and an i-Gel airway deployed. At around 16.00 hours the i-Gel was replaced by an endotracheal intubation tube. However, this was inserted into Mr Saint's oesophagus rather than his trachea. The oesophageal placement was not identified by the three anaesthetists present (including two consultants), notwithstanding the fact that an experienced Senior Operating Department Practitioner specifically raising his concerns that the intubation tube was misplaced by reference to the capnography which indicated an absence of a CO end tidal wave on the monitor and the apparent "timpanic" distension of the patient's stomach. At or around 16.04 hours Mr Saint suffered a cardiac arrest and chest compressions were commenced. The oesophageal placement of the endotracheal tube was only confirmed at or around 16.25 hours and the intubation tube was relocated in the trachea.

For a period of around 38 minutes, from approximately 15.47 hours until 16.25 hours Mr Saint received no effective lung ventilation. For some 25 minutes of that 38 minute period the endotracheal intubation tube

was incorrectly located in Mr Saint's oesophagus. Throughout, confirmation that Mr Saint was receiving no effective lung ventilation was displayed on the monitoring equipment as an absence of any CO2 end tidal wave consistent with effective lung ventilation, together with a digital read out of 'zero' immediately adjacent to the CO2 end tidal wave display.

Mr Saint was transferred to the Intensive Care Unit (ICU) of Hinchingsbrooke Hospital where he died at 13.44 hours on 28th June 2016.

5 CORONER'S CONCERNS

The MATTERS OF CONCERNS are as follows:

- (a) During the course of evidence I heard that an (admitted) "misunderstanding of physiology" led the lead consultant anaesthetist involved in the treatment of Mr Saint to conclude that whilst the patient was receiving appropriate chest compressions during resuscitation efforts, the capnography indicating an absence of a CO2 end tidal wave on the monitor could be explained by the fact that Mr Saint was in cardiac arrest. This was a mistake since exhaled CO2 can virtually always be observed during cardiac arrest with correctly applied compressions and lung ventilation. The clear expert evidence was that, discounting a technical problem with the monitoring equipment (not applicable here), the absence of a proper CO2 end tidal wave could only in the most exceptional circumstances be accounted for by anything other than oesophageal intubation and certainly not by cardiac arrest. Further, the expert evidence indicated that such a "misunderstanding of the physiology" is one that is known to be shared by other anaesthetists.

This is of particular concern given that the issue was specifically addressed in the 4th National Audit Project (NAP4) of the Royal College of Anaesthetists and the Difficult Airway Society: '*Major Complications in Airway Management in the UK*' Report and Findings as long ago as March 2011 (at page 101):

*"Unsurprisingly, the outcome of unrecognised oesophageal intubation is usually very poor indeed. Tracheal intubation in theatre is nowadays carried out in the presence of a trained assistant and a tested and functioning capnograph. The latter, in particular, means that unrecognised oesophageal intubation rarely occurs in the theatre environment. In contrast to the ICU and emergency department cases where capnography was not used, in the cases of oesophageal intubation during anaesthesia capnography was in use during the event. **The event progressed due to failure to correctly interpret capnography in the face of situations of peri-arrest or cardiac arrest. Capnography can become difficult to interpret during low cardiac output states and in cardiac arrest. However a flat line is not usual and even in cardiac arrest, during CPR, carbon dioxide is produced leading to an attenuated but visible capnography trace (see Figure 1). A completely flat capnograph in any circumstances should immediately raise the possibility that the tracheal tube is not in the trachea, or is obstructed. Active measures should be undertaken to confirm or exclude these diagnoses. Clinical signs are unreliable in these circumstances and it is recognised that oesophageal intubation may present both after apparent normal auscultation of the lungs and as cardiovascular collapse.**" (Emphasis added).*

The Report made the following recommendation:

"Training of all clinical staff who may intubate patients should include interpretation of capnography. Teaching should include recognition of the abnormal (but not flat) capnography trace during low cardiac output states and during cardiopulmonary resuscitation."(page 103).

I am concerned that the evidence in this case, including the expert evidence, established that notwithstanding the findings and recommendations of the 2011 NAP4 there is a continuing failure to ensure that capnography is sufficiently understood and utilised by all clinical staff who may intubate patients.

- (b) The evidence heard, including the expert evidence, confirmed that an integral part of the process of intubating a patient requires that the anaesthetist, following the placement of the intubation tube

into the patient, observes the capnography for a period of up to 15 to 20 seconds to ensure that a "proper CO2 end tidal wave" can be detected; failure to do so would be a "fundamental and basic error" and a "serious error". I am concerned that this procedure was not followed by either the lead consultant anaesthetist in this case or the anaesthetists who attended to assist him. The expert evidence indicated a lack of widespread, regular, mandatory on-going training for anaesthetists in drills dealing with crisis situations potentially facing an anaesthetic team particularly in relation to the issues of "task fixation" and "confirmatory bias", and that such training would be beneficial.

6 ACTION SHOULD BE TAKEN

In my opinion action should be taken to prevent future deaths and I believe you (and/or your organisation) have the power to take such action.

7 YOUR RESPONSE

You are under a duty to respond to this report within 56 days of the date of this report, namely by 12th January 2018. I, the coroner, may extend the period.

Your response must contain details of action taken or proposed to be taken, setting out the timetable for action. Otherwise you must explain why no action is proposed.

8 COPIES and PUBLICATION

I have sent a copy of my report to the Chief Coroner and to the following Interested Persons:

██████████ (brother of the Deceased);

The Executors of Mr Saint's estate;

I am also under a duty to send the Chief Coroner a copy of your response.

The Chief Coroner may publish either or both in a complete or redacted or summary form. He may send a copy of this report to any person who he believes may find it useful or of interest. You may make representations to me, the coroner, at the time of your response about the release or the publication of your response by the Chief Coroner.

9

Signed:



Sean Horstead Assistant Coroner for Cambridgeshire & Peterborough

Dated: 17.11.2017