



*Western*

*Australia*

## **RECORD OF INVESTIGATION INTO DEATH**

*Ref No: 24/03*

*I, Evelyn Felicia VICKER SM, Deputy State Coroner, having investigated the death of **Richard Christopher JANKOWSKI**, with an Inquest held at the Perth Coroner's Court, 172 St George's Terrace, Perth and the Central Law Courts, Perth on 8,9 and 16 July 2003 find the identity of the deceased person was **Richard Christopher JANKOWSKI** and that death occurred on 20 February 2001 at Royal Perth Hospital as a result of Hypoxic Brain Injury due to Respiratory Obstruction following Surgery for a Dental Abscess with Cellulitis in the following circumstances.*

The deceased was 39 years of age having been born on 17 July 1961. At the time of his death he resided in Mundaring with his wife and two children. He was employed and appears to have been a happy, healthy, family man who rarely visited his

Doctor other than for minor medical ailments. He also had a happy and normal extended family.

### **EVENTS LEADING TO HOSPITALISATION**

The events leading to hospitalisation of the deceased appear to have started on Wednesday 14 February 2001. Mrs Jankowski advises the first indication of a problem appeared to be when her husband returned home from work on that date, stating he had taken Panadol because he had a sore tooth and a sore throat. She stated his throat was looking very swollen. Mrs Jankowski had a migraine that evening and the deceased attended to the children. He had nothing to eat because of his throat.

The following morning he awoke and was unable to eat his breakfast due to the swelling of his throat. When he attended work he was told to return home as a result of his type of work and the fact he was medicated. As a result the deceased visited his general practitioner, Dr Bloor.

Dr Bloor diagnosed a wisdom tooth abscess and prescribed the deceased Amoxycillin 500mg QID, Panadeine Forte for analgesia and gave him an intramuscular injection of 1.5grams of Procaine Penicillin. The deceased returned home and went to bed.

His wife reports he didn't sleep well, he was in pain, his throat was very swollen and he was in extreme distress which restricted his movement. He managed to take his oral antibiotics despite having great difficulty swallowing. He managed some fluids, but was unable to eat.

When he woke on Friday 16 February 2001 the deceased was still in a great deal of pain and attended a dentist, Dr Bailey, as a new emergency patient. Dr Bailey observed a large swelling covering the whole of the submandibular region. He was advised the swelling had originally been on the left side but had now extended to the whole area. The deceased could only open his mouth a small amount as a result of the pain which started from the left lower region. Dr Bailey noted there was considerable swelling around the third molar on the left side. A firm swelling extended from the left to the right lower borders of the mandible. The dentist could not see an obvious abscess site for incision and, as a result of the extent of the infection, did not believe it appropriate to deal with it in his surgery. Dr Bailey contacted the deceased's general practitioner for review with respect to the antibiotics.

The deceased re-attended Dr Bloor and was prescribed Flagyl 400milligram tablets and in addition given a further intramuscular injection of 1.5grams of Procaine Penicillin.

Dr Bloor commented in his report there were "no untoward features in what appeared to be a routine dental abscess".

At 5:00pm that evening the dentist, Dr Bailey, contacted the deceased who stated he was "feeling better". Mrs Jankowski tells us the deceased was actually in bed when the dentist called but he got up to speak with the dentist. The dentist advised the deceased he should ring Swan District Hospital if there was any further swelling during the night. The deceased returned to bed.

At 1:30am on Saturday the 17 February 2001 the deceased woke his wife and told her he was feeling much worse. He called an ambulance. The ambulance arrived at approximately 2:20am and the deceased managed to walk to the ambulance.

The deceased presented to Swan District Hospital at 2:40am. Dr Goudie of Swan Health Services Emergency Department advised examination revealed a young man who had difficulty speaking and indicated a history of pain and swelling resulting from a dental abscess to the point he was not able to eat or drink. He also indicated some difficulty breathing at night. The doctor noted a diffuse swelling on the anterior aspect of the deceased's neck with a fluctuant area. His skin was warm and there was associated lymphadenitis. The doctor could see no obvious source of infection within the oral cavity. The

diagnosis of dental abscess was confirmed and he was treated with intravenous fluids. The deceased declined any analgesia. The resident doctor in emergency treating the deceased discussed the case with the on-call Ear, Nose and Throat Registrar who advised intravenous Flucloxacillin and Metronidazole and that the deceased be transferred to Royal Perth Hospital. This was arranged at 5:00am.

The first Mrs Jankowski knew of events was when her husband rang her at 6:00am from Royal Perth Hospital to tell her he was there and he would call her later at about 9:00am.

Mrs Jankowski had not heard from her husband by 9:30am so she rang Royal Perth Hospital to be told he was in surgery and to call back later.

## **SURGERY**

The deceased was checked into triage at 5:53am and out of triage at 5:55am. The progress note at 6:17am indicates the deceased had a swollen central neck but denied difficulty in breathing although he reported being unable to swallow or, even spit. By 7:04am he had been reviewed by the Emergency Resident Medical Officer and Registrar for Ear, Nose and Throat. There is a note he is to be admitted under the ENT team when a bed is available and his wife is aware of his admission. This presumably follows the deceased advising the

hospital he had telephoned his wife and had advised her he was at Royal Perth Hospital. The note at 7:48am indicates the deceased had not been given intravenous antibiotics, as the ENT registrar was happy for that to occur in Theatre. The deceased was conveyed to Theatre for surgery.

The on-call Oral and Maxillofacial Surgeon for Saturday 17 February 2001 at Royal Perth Hospital was Mr Clive Purcell. He was contacted by the Registrar, Dr Braad Sowman, at approximately 7:15am and advised the deceased was present, as an overnight admission, with odontogenic infection with spread into the neck. Mr Purcell advised Dr Sowman surgery should be arranged for incision and drainage of the abscess and that Mr Purcell would attend the Hospital. As part of the preparation for surgery the deceased had to be assessed by the Anaesthetics Department.

Theatre 6 was secured for surgery to commence at 8:15am. The intention was for Dr Sowman to start surgery and the consultant, Mr Purcell, to continue on his arrival in Theatre.

Dr Kate Thornton was the duty Anaesthetist of the day and she assessed the deceased at approximately 8:00am in Theatre 6 prior to surgery. The Resident Medical Officer on duty was Dr Dev Shakar Segarajasingam.

On examination Dr Thornton found the deceased to have a well defined bilateral swelling in the sub-mandibular region which did not extend to his larynx. He was only able to open his mouth about 2cm because of the pain he experienced. She found there was no airway compromise and the trachea was central and easily palpable. While he had difficulty swallowing due to pain he was able to lay flat without it impacting on his ability to breath.

As a result of the examination Dr Thornton authorised the deceased being taken into the operating Theatre and prepared for surgery. Dr Segarajasingam assisted her. Once in theatre he was fully monitored by way of ECG, non-invasive BP, and SAO<sub>2</sub>. He was pre-oxygenated for about 5 minutes and Cophenylcaine was sprayed into his nostrils.

Dr Thornton preformed a slow Propofol (dipravan) intravenous induction and monitored his airway to ensure it remained patent and he was capable of spontaneous breathing. After 200mgs of Propofol had been administered there was no loss of the deceased's airway and Dr Segarajasingam was able to maintain the airway easily with bag mask ventilation. A size 7 nasal airway was inserted into his left nostril and the circle breathing apparatus attached with O<sub>2</sub> and 4% Sevoflurane from the anaesthetic machine. The deceased was still breathing spontaneously.

Dr Thornton inserted the fibre optic laryngoscope down the deceased's right nostril and was able to locate the vocal cords which although swollen were clearly defined and had a large patent lumen. At that time it was easy to observe the internal structures by way of the fibre optic laryngoscope and Dr Thornton sprayed 4% lignocaine onto the vocal cords and inserted a 6.5 endotracheal tube over the laryngoscope. There was no difficulty with intubation although there is a note in the medical records indicating the swelling was significant. Once effective intubation had been achieved medication was given for the maintenance of anaesthesia and 5 milligrams of morphine for pain.

Mr Purcell arrived during intubation at approximately 8:40am. On examination he found the deceased exhibited swelling in the left submandibular triangle. After examination of the extent and type of swelling Mr Purcell was satisfied as to the source of the infection causing the swelling and proceeded to incise and drain the abscess. Four drains were placed in the infected area and the offending tooth removed. During this procedure anaesthesia was maintained and there was no difficulty with the deceased's airways.

Mr Purcell and Dr Thornton had discussed the use of Dexamethasone during the operation to reduce any post

operative swelling, however, infection is a contra-indicator to the use of Dexamethasone and it was decided it would not be administered. The doctors did not believe there would be a likelihood of airway compromise despite the location of the area of swelling. He was given benzyl penicillin 1.2grams and metronidazole 500 milligrams.

Mr Purcell and Dr Thornton also discussed whether or not the deceased should be extubated. Both were agreed there had been no difficulties with the deceased's airway during surgery and they considered it to be an unlikely event post operatively. They agreed on extubation. I was advised at Inquest decisions with respect to Dexamethasone and extubation are decisions jointly reached between the attending surgeon and senior anaesthetist.

Prior to extubation Dr Thornton reviewed the deceased's vocal cords through a laryngoscope with the endotracheal tube still in situ. She had a reasonable view of the epiglottis, which was not significantly swollen, although general swelling of the area made it difficult to manoeuvre any of the structures. His airway did not appear to be compromised and due to the amount of pus which had been drained Dr Thornton believed the deceased would be able to breath for himself. At the conclusion of her examination the deceased was breathing spontaneously and Dr Thornton waited until he was moving

before removing the endotracheal tube. He was moving enough to maintain his own airway. Mr Purcell also remained in the theatre block until the deceased had been extubated. At Mr Purcell's final review he was sitting up and appeared undistressed. Mr Purcell went on to review his other patients and returned home.

### **POST SURGERY**

While both the surgeon and Dr Thornton were of the view there was unlikely to be difficulty with the deceased's airway it was decided he should be in a high observation area. An attempt was made to arrange a bed for him on the nurses specials unit. This was done but the bed was not available until 2:00pm. As a result it was planned he would be kept in recovery until this bed was available. He was the only patient in Recovery and was placed in Bay 1. He had been given intravenous antibiotics at 9:00am.

The surgeon's instructions for post operative care were he be maintained with his head up, he be given continuous oxygen by mask, and adrenaline nebulisers as charted.

The deceased was placed in Bay 1 in recovery at 9:51am. He was able to speak at this stage and told the nurse he was uncomfortable due to the pain on swallowing. He was maintained with his head up to enable him to spit secretions

more easily and in an attempt to minimise swelling. Dr Thornton handed over to the recovery-nurse-in-charge Ms Hamson, with instructions as to the drugs already administered, those to be administered and the fact the deceased was to be provided with oxygen at 6 litres per minute for 24 hours with continuous oxygen saturation monitoring, and 4 hourly adrenaline nebulisers to be administered. A mini-tracheostomy set was also to be kept by his bedside as a precautionary measure. This was in the event there was a sudden deterioration in his airway and a surgical airway needed to be established in an emergency. Dr Thornton returned to theatre for her next listing.

Ms Hamson advised the inquest the deceased's oxygen was transferred to the wall oxygen outlet in Bay 1, he had a blood pressure cuff on his arm and a pulse oximeter on his hand. Ms Hamson remained at the deceased's head in order to monitor both his condition and to perform regular suctioning due to his difficulty in swallowing. Due to the deceased's drains and swelling he could not speak normally but Ms Hamson was satisfied he was quite "with it" and able to advise her as to his condition. She continued to suction his mouth and throat as best she could. The deceased took the suction tube from Ms Hamson and suctioned his own mouth and throat as required. Ms Hamson asked the deceased if he

was in pain and he indicated he was. She administered morphine and he indicated this assisted .

In nurse Hamson's view the deceased was ready to be transferred to the high dependency unit at about 10:45am however there was still a difficulty with the availability of a bed and he remained in recovery. His observations remained stable and he did not appear to be in any distress. There was difficulty in maintaining the positioning of the Hudson mask and it was not maintained in place for all of the time.

At approximately 11:30am Ms Jankowski arrived at the Hospital to look for her husband. She attended ICU. She was advised they were waiting for a bed to become available for the deceased but he was not yet there. I appreciate the difficulties with family being able to speak with patients while in recovery but consider it, in the circumstances of this case, to be a tragedy Mrs Jankowski did not have the opportunity to speak with and see her husband. He was at that stage orientated to time and place and while I understand nobody envisaged the events which were about to unfold, it would have been so much better if Mrs Jankowski had at least that opportunity to communicate with her husband.

Ms Hamson indicated to the court at approximately 11:50am the deceased became agitated by the dental pack in his mouth

and asked for it to be removed. This was done and although the deceased told the nurse he was well she was of the view he seemed to be unexpectedly agitated and distressed. She asked for Dr Thornton to be called to recovery to review the deceased.

Dr Thornton indicated she received the message on her pager at 11:59am and arrived in recovery promptly. The situation with the deceased was discussed and he advised Dr Thornton he did not believe he was having difficulty with his breathing although he was getting tired. Dr Thornton noted no evidence of airway compromise but there was a slightly increased respiratory rate. His oxygen saturation was 97%. The deceased's oxygen saturations had remained above 95% while recorded. The last entry in the medical chart is at 11:55am when it was 96%.

Dr Thornton noted he had not yet been administered an adrenaline nebuliser and requested he be given one immediately. She increased the dose to 1mgs adrenaline in 5mls of water to be given via the nebuliser and that the deceased be sat up. She returned to theatre to attend to the patient there under anaesthesia. After checking that patient Dr Thornton called the consultant anaesthetist, Dr Gross, from theatre as she felt the situation to be fairly busy and believed extra assistance may be required. Dr Gross said she

would be there in 10 minutes and as Dr Thornton was not aware of any emergency at that stage this seemed satisfactory.

Meanwhile nurse Hamson was in the process of administering the deceased's adrenaline nebuliser when he started to experience significant breathing complications. She sat him up and asked the other recovery nurse to call Dr Thornton urgently. Dr Thornton recorded the time of that call on her pager as 12:12pm and she arrived within 20seconds collecting Mr John Pearce, the Anaesthetic technician, on her way. On her arrival Dr Thornton saw the deceased was sitting upright with a severe stridor and accessory muscle use. The other recovery nurse, Peter Nunan, was holding the face mask to the deceased's face to administer 100% oxygen.

The deceased was clearly in distress although his colour and his oxygen saturation was still good. Dr Thornton considered a respiratory arrest was imminent and the deceased would require immediate intubation. She advised those present she intended to intubate and moves were made to provide all the necessary instrumentation. I note a number of the items had to be fetched from the technicians' room relatively some distance away rather than at hand. Due to the condition of the deceased it was necessary he be anaesthetised to allow intubation to occur.

While the deceased was being prepared he lost his airway entirely and was unable to breath. This constitutes a time critical emergency and the emergency bells were rung. Due to her focus on the condition of the deceased Dr Thornton did not register a call would be more effective if wider than the Anaesthesia Department reached by the emergency called.

At this point there was Dr Thornton, two anaesthetic technicians, and two recovery nurses attending to the deceased. Dr Thornton attempted a bag/mask ventilation but this only caused stomach distension indicating air was not reaching the lungs but passing down the oesophagus. Dr Thornton used a laryngoscope to try and assist but was unable to visualise any of the structures due to severe swelling. She initially attempted to pass a Porges Bougie over the laryngoscope down into the trachea however was unsuccessful. She requested a gum elastic bougie to be brought to her which was inserted. She attempted to railroad an endotracheal tube over the bougie into the trachea.

Ventilation commenced but due to the inability to visualise the passage of the bougie and therefore path of the endotracheal tube it was not clear whether or not there had been tracheal intubation. The recovery nurse, Mr Nunan, was asked to listen for breath sounds. Mr Nunan believed he could hear breathing and Dr Thornton also thought there appeared to be chest

movements. Initially this intubation was thought to be successful and ICU were asked to provide a bed. It was while the nurse was attempting to arrange this Dr Thornton asked Dr McGrath, the ICU Senior Registrar, be asked to attend. He was not advised of the detail of the problem.

Dr Thornton instructed 50 mgs of propofol be given in anticipation there would now be improvement in the oxygenation and ventilation of the deceased.

All present believed there was an initial slight improvement in his colouring but then no further improvements. His heart rate dropped and he was administered Atropine to try and return his heart rate to normal. Due to his lack of improvement Dr Thornton checked for breath sounds herself and was satisfied Mr Nunan had been correct.

When there was still no improvement in the deceased's colour with ventilation it was realised intubation may not have been successful. Dr Thornton listened for stomach sounds but could not detect any. Consequently she still believed there was correct intubation but requested there be carbon dioxide monitoring to confirm this. Apparently patients in recovery, while monitored as to their oxygen saturations, are not monitored as to their expired carbon dioxide. As a result of Dr Thornton's request Mr Pearce (anaesthesia technician)

plugged the datex capnomac gas and vapour monitor into the power outlet in the wall and connected its gas sampling tube to the sampling port on the airway filter. Ms Homes (anaesthesia technician) noted the pulse oximeter on the datex AS-3 compact monitor was not displaying a number or a wave form trace on its screen. The ECG while still regular was slowing.

After the warm up period the datex capnomac monitor displayed measurements of gas concentrations sampled from the deceased's airways. It showed inspired oxygen but no carbon dioxide indicating ventilation was not occurring. At about that time it was noted there was abdominal distension although those listening still believed they could hear breath sounds.

Ms Homes removed the carbon dioxide analyser gas module from another trolley mounted datex compact AS-3 physiological monitor in Bay 9 and inserted it into the appropriate slot of the datex AS-3 compact physiological monitor already attached to the deceased in Bay 1. It was only then it was confirmed there was no typical carbon dioxide wave form and the deceased was not being ventilated. This was a more than critical situation due to the elapse of time, and the fact the deceased could not breath spontaneously due to anaesthesia and his obstructed airway.

While listening for breath sounds but being aware of the warm up difficulty with the carbon dioxide monitor Dr Thornton asked for a fibre optic laryngoscope to be made available so she could attempt to visualise the position of the endotracheal tube as she had in theatre.

The fibre optic laryngoscope (bronchoscope) had to be brought from the technicians' room, and again, it required to be moved and plugged in prior to being available for use. This was done but while the light source was heating it malfunctioned and became inoperative. Dr Thornton realised the scope was not being made available and the situation was too critical to assume correct intubation. It was confirmed there was no CO<sub>2</sub> wave form. She removed the endotracheal tube and attempted to re-intubate with another boggie. This was again unsuccessful and cardiac massage was commenced (at about 12:25pm) to maintain a cardiac output.

Dr Thornton realised the situation was critical and it would be necessary to force a surgical airway in the deceased's trachea.

Dr McGrath arrived in recovery at that time and told the inquest Dr Thornton appeared to be moving from one procedure to another as required. He registered the smell of the smouldering fibre optic laryngoscope (bronchoscope) and

realised the situation was critical. He contacted ICU to request the consultant attend urgently.

Dr Thornton attempted to perform a cricothyroidotomy. This requires an incision into the trachea at the point of the cricoid membrane. Dr Thornton made the initial incision, but appeared to be unable to sit the cannula into the trachea and thereby assist in jet ventilation. Dr Thornton made two attempts, both with the Minitrack catheter, and then the 14 gauge Venflon IV Catheter Kit.



*VBM Catheter Insertion*



*Manujet Ventilator and VBM Catheter*

Dr Gross, consultant anaesthetist, arrived in recovery. She had arrived as requested by Dr Thornton and discovered the emergency on hand. Dr Gross took over management of the airway. She did not immediately continue with the cricothyroidotomy but attempted to assess the situation. She requested a long blade laryngoscope hoping to be able to observe the airway but found the light source inadequate. She

attempted to intubate via a blind intubation but abandoned the approach within seconds and proceeded to consider a needle cricothyroidotomy. She observed the incision made by Dr Thornton in her attempt. The external tissues of the deceased's neck were not swollen and it was possible to easily palpitate the thyroid and cricoid cartilages, the reference points for correct cricothyroidotomy.

Dr Edibam the ICU Consultant arrived while Dr Gross was aborting the blind bougie intubation. He noted the deceased's signs were critical and suggested an attempted placement of a laryngeal mask (LMA) while he noted Dr Thornton's incisions for the attempted cricothyroidotomy were correctly placed.



*Laryngeal Mask Insertion*



*Laryngeal Mask + Ventilation System*

The use of the LMA appeared to cause motion of the chest with bag/mask ventilation through the mask. However, Dr Edibam confirmed to the court it is always difficult to be confident as

to adequate ventilation. He could see the situation with the deceased was critical and decided to continue with a cricothyroidotomy. This he did, without complication.

Dr Edibam advised the inquest he had performed this procedure less than five times in his medical career and this was the only time in which he had performed a cricothyroidotomy in emergency conditions. I note from his experience he had qualified as a medical practitioner a year before Dr Thornton, but he had good experience in anaesthesia, as well as intensive care. Being an intensive care specialist, however, he was comfortable performing procedures with a scalpel which was what he had used for the cricothyroidotomy, as opposed to the needle cannula used by Drs Thornton and Gross. Dr Thornton also had a good range of experience since qualification as a medical practitioner.

At the conclusion of the procedure Dr Gross transferred the deceased's breathing circuit onto the endotracheal tube inserted by Dr Edibam and both the deceased's lungs expanded and carbon dioxide registered on the capnograph.

Having achieved adequate ventilation, the deceased's unstable ECG rhythm eventually reverted to a supraventricular tachycardia output and cardiac compressions were stopped. Dr Edibam sited a femoral triple lumen catheter and nursing

staff prepared an adrenaline infusion. The deceased's condition began to stabilise, however, his arterial blood gas demonstrated a mixed metabolic/respiratory acidosis. Dr Turner, Anaesthetic Consultant on call for Acute Pain Service, arrived and took over immediate care of the deceased.

Mr Purcell, having been called, attended in recovery. He believed the external swelling was no worse than it had been at the end of the operation. The deceased was returned to theatre and a formal tracheostomy performed prior to the deceased's transfer to the intensive care unit.

### **POST INCIDENT**

Mrs Jankowski was informed at 1:00pm on 17 February 2001 by Dr Edibam of the complications arising after surgery. She was told her husband was in a serious situation. She was not allowed to see him until 4:00pm that evening by which time it was clear the deceased was not able to survive independently. He was maintained in ICU until Tuesday 20 February 2001 when he was removed from artificial ventilation. He died at 6:30pm that evening being unable to sustain life independently.

Prior to the death of the deceased his family attended a meeting with doctors from Royal Perth Hospital, including Dr Thornton. The procedures were explained and Dr Thornton

appears to have been entirely truthfully and factual with the explanation she gave of events. This included her lack of experience in performing cricothyroidotomies. She apparently stated she had never performed the procedure on a person before and had only practiced on goats.

Evidence was received at the inquest it is not a procedure which any doctor “practices” on live human patients. It is an emergency procedure, carried out mainly in emergencies, often by surgeons who are used to welding a scalpel. Dr Riley (Clinical Director of CASMS) indicated in a recent review of the procedure by surgeons, only 37% of those asked had ever performed the procedure. As indicated by Dr Edibam, of those, most were done in a controlled emergency situation rather than a critical emergency situation.

Dr Thornton also stated she panicked. While I have no doubt that was her emotional state, no one present during the crisis observed her doing anything other than move appropriately through the recognised procedures for a compromised airway. The same steps as taken by Dr Gross, and successfully completed by Dr Edibam.

Not unnaturally the family of the deceased are distraught. The deceased went from being a healthy active young man with no major medical problems, to being unable to sustain life

independently, in the space of 20 minutes, while in the recovery room of one of Western Australia's three major teaching hospitals.

### **POST MORTEM EXAMINATION**

The post mortem examination of the deceased was undertaken by Dr Clive Cooke on the 22 February 2001. Following additional investigation Dr Cooke determined on the 11 June 2001 the cause of death of the deceased was Hypoxic Brain Injury due to Respiratory Obstruction following surgery for a dental abscess with cellulitis.

Photographs taken of the deceased's laryngeal and epiglottal area indicated there was infection in the soft tissues, especially on the left side, at the top of the neck around the mandibular region. Despite medical/surgical intervention the tissues of the throat region were swollen (the infective process would have continued after surgery until the death of the deceased some three days later). There was also an accumulation of fluids in the deceased's lung and chest cavity and congestion of his liver and spleen. There were indications of early arteriosclerosis but not such as would have contributed to the deceased's respiratory distress on the 17 February 2001.

The Chemistry Centre analysis of the deceased's admission blood indicated a low level of cannabis product, again nothing which would have affected the deceased's respiratory distress on the 17 February 2001.

A Staphylococcus organism was identified at post mortem, however, the hospital's medical file indicates a Streptococcus organism was found on culture which was sensitive to the antibiotics being used on the deceased. I also note once in ICU the deceased's antibiotic prescription was again doubled.

Dr S Knott, a forensic dentist, assisted Dr Cooke in his examination of the site of the dental abscess. They discovered;

*"there is a sinus track extending through the inner (medial) aspect of the body of the mandible, the sinus track being situated 44 mm in front of (anterior to) the rear (posterior) aspect of the ramus of the mandible . The sinus is oval in shape, measuring 5.7 X 7.8 mm.*

*The sinus opening is situated approximately adjacent to the apex of the root of the left third molar. This molar is not present – the cavity contains slightly haemorrhagic tissue which extends to the sinus track opening through the medial aspect of the mandible. The cortical bone of the outer aspect of the mandible appears unremarkable, and is thick up to 2-3 mm in thickness. The adjacent*

*cancellous bone around the tooth cavity is of soft consistency".*

The infection was clearly the infection for which the deceased had required surgery in the first place. The dental abscess appears to have been naturally arising but was uncontrolled by the antibiotic medication given prior to surgery. The level of antibiotic was elevated to standard levels for the procedure during the course of surgery, however, despite a period of 2 hours having lapsed from surgery it appears the infection caused swelling to the extent it obstructed the deceased's airway in the vicinity of the epiglottis around noon and shortly thereafter on the 17 February 2001. Because of the prolonged difficulty in re-inserting an airway the deceased suffered a cardio respiratory arrest with consequent hypoxic brain injury.

### **CONCLUSION AS TO THE DEATH OF THE DECEASED**

I am satisfied the deceased was a healthy fit young man with no known medical problems who experienced what was initially a sore throat. It progressed to a stage of swelling which caused him considerable pain and he attended both his doctor and a dentist.

He did everything one would expect a prudent family man to do to ensure his appropriate medical care. He followed

medical advice given to him for management of his dental abscess.

In the early hours of the 17 February 2001 he contacted an ambulance to take him to hospital realising the difficulties with his pain and swelling were not being managed. He was sent from Swan District Hospital to Royal Perth Hospital for emergency treatment and consented to prompt attention as a public patient.

Surgery for the draining of his dental abscess commenced at approximately 8:15am after his assessment by Dr Kate Thornton as the senior anaesthetic registrar.

The process of draining pus from the abscess passed uneventfully and he was given a standard dose of antibiotics for that procedure at 9:00am. He was returned to recovery while awaiting admission to the high dependency unit as the appropriate placement for him following surgery. It was recognised by both the surgeon and senior anaesthetic registrar he was at some risk of airway compromise due to the location of his infection and the required surgery, although there were no physical signs at that stage he would experience difficulty.

He appeared to be recovering well once extubated and was able to assist the recovery nurse caring for him with matters related to his welfare.

Shortly before noon the recovery nurse detected some difficulty with the deceased although she was unable to articulate precisely her concern. She recalled Dr Thornton to recovery who examined the deceased and on his reassurance, and her noticing his oxygen saturations were still satisfactory, she prescribed an increase in the administration of adrenaline nebulisers. Dr Thornton return to surgery where she had another patient under anaesthesia.

I am satisfied the deceased was experiencing an infection which was causing swelling of the tissues within the vicinity of his airway which was slow to accumulate and went without notice until it reached a critical level.

As the recovery nurse prepared to administer the nebuliser the deceased's airway compromise became critical and he commenced a stridor with associated extreme physical agitation.

Dr Thornton was recalled from surgery and realised the situation was time critical and proceeded to anaesthetise the deceased for intubation. Due to the swelling in the vicinity of

the deceased's epiglottis intubation was oesophageal but this was not immediately realised due to the apparent "breath sounds" and a lack of trust the capnograph was functioning adequately.

Significant times in terms of adequate ventilation elapsed before the lack of appropriate intubation was established. This difficulty with intubation is a recognised complication with airway compromise.

An emergency was called while Dr Thornton attempted to continue with intubation attempts, including her failed attempts at needle cricothyroidotomy. The emergency call as set up at that time did not reach any appropriate professional support and it was by chance Dr Gross followed by Dr Edibam, appeared in recovery shortly thereafter.

Dr Gross was about to attempt the cricothyroidotomy when Dr Edibam appeared and suggested the use of a laryngeal mask airway. This appeared to assist. Dr Edibam considered it necessary to still perform the emergency cricothyroidotomy which then proceeded without further complication.

Despite the return of the deceased to adequate ventilation his significant hypoxia could not be reversed and he ultimately

died three days later as the result of the oxygen deprivation experienced during the airway obstruction.

I find the death of the deceased resulted from a lack of adequate immediate systems response to a recognised risk of airway compromise in a patient recovering from the type of surgery it was necessary to undertake.

While I am not satisfied any one individual in the scenario caused or contributed to the problems incurred I do consider the community does not expect a person in the situation of the deceased to die in a major teaching hospital from airway compromise in these circumstances.

I find the death arose by Misadventure.

### **COMMENTS ON THE ADMINISTRATION OF PUBLIC HEALTH**

Section 25(1) of the Coroner's Act 1996 requires a Coroner to, if possible, establish:

- a The identity of the deceased
- b How the death occurred
- c The cause of death
- d The particulars needed to register the death under the births, deaths and marriages registration act 1998.

By subsection (2) a Coroner may comment on any matter connected to the death including public health. The role of the Coroner is not to determine civil liability, that is specifically prohibited by the Coroner's Act 1996 (s25(5)). It is to look at the circumstances of the death and consider whether or not anything could have been done to prevent the death.

The deceased in this case did everything a person could do to ensure his continued ability to maintain his family. He attended his doctor and followed advice from both his doctor and dentist. He called an ambulance and took himself to hospital and consented to surgery.

Consequently while I accept the actual cause of the deceased's death arose from natural causes, that is an infection originating from a dental abscess, I do not believe it acceptable he died while in a tertiary hospital from the effects of airway compromise.

Examination of the events occurring in recovery between noon and 12:30pm on the 17 February 2001 indicate a systems failure which I do not believe can be attributed to any one factor. I believe it is to be divided into two significant areas.

One, the failure of the system to provide the immediacy of appropriate equipment for a potentially high risk patient in the deceased's circumstances; and

Two, the lack of appropriate professional support to the senior anaesthetic registrar for an emergency of this type, a known risk of airway compromise.

I appreciate the input of Dr Leigh Coombs (Head of Department, Anaesthesia) and accept the events as they unfolded between noon and 12:30pm on Saturday 17 February 2001 are every anaesthetist's nightmare. There is only a very limited time in which to correct an obstructed airway. There is no room for error if there is not to be an outcome adverse to the patient. It is for this reason all the support systems need to be in place and ready to operate.

I also accept the changes made since this event will help streamline access to appropriate support, both technical and professional. Not the least of which I consider to be a CO<sub>2</sub> wave form monitor functioning at all times where there is a risk of airway compromise, not just when a problem arises.

## **EQUIPMENT**

The importance of the availability of appropriately functioning equipment in an emergency does not just rest in the fact of the

equipment itself, but also in the psychological support it provides to those dealing with the emergency. In this case the delay in confirmation the initial intubation in recovery was not properly placed certainly exacerbated the emergency for Dr Thornton. Firstly, the delay was critical, but secondly, it would also have affected her confidence in being able to rely upon the recognised procedures for airway compromise.

At initial intubation in theatre Dr Thornton had used the fibre optic laryngoscope down the nostril of the deceased. It had been noted at that stage there was laryngeal oedema and mild distortion. Thus even then it was necessary for good visualisation for proper intubation.

In the later events that unfolded in recovery, not only was there a delay while Dr Thornton could only check appropriate intubation by way of breath and stomach sounds, but she was also denied the opportunity of immediate adequate visualisation by use of the fibre optic bronchoscope.

Again, while that equipment was available, it was not immediately available to Dr Thornton at the time she needed it. Consequently her confidence in being able to mechanically or visually check the adequacy of intubation was compromised. Correspondingly I believe this also

compromised her confidence in performing a cricothyroidotomy when it became necessary.

Dr Thornton certainly recognised she was at an emergency stage and knew what to do. Everything conspired to make her physical application of skills unsuccessful. One can only speculate the immediate and appropriate utilization of a capnograph clearly indicating there was no expired air, and a fibre optic bronchoscope immediately to hand to indicate intubation was not through the trachea, would have resulted in the passage of less time before the attempted cricothyroidotomy and more confidence in the outcome.

I accept to some extent this has been addressed by the hospital's reconfigured "standard intubation trolley" which



*Current Standard Intubation  
Trolley + Additional  
Resources*



*Emergency O<sub>2</sub> Delivery System*

*14G Venflon*

*VBM Needle*

*Mini Trach*

*Blade*

*Cricothyroidotomy*

now has the additional resources Dr Thornton had to request. Also, the construction of an “airway resource trolley” as opposed to the “difficult intubation box”.

I note the “airway resources trolley” now also contains LMA’s which were previously less recognised as being useful in some emergency airway compromise situations. I note there is still not an “airway resources trolley” located in the recovery room, although there is apparently one in the technicians room.



*Airway Resource Trolley*

<i>Various Laryngoscopes</i>	<i>VBM NEEDLE</i>
<i>Airways</i>	<i>Mini Trach</i>
<i>Tracheal Tubes</i>	<i>Scalpel + Tracheostomy Tube</i>
<i>'Fast Trach' 3,4,5</i>	<i>Helium + Oxygen</i>
<i>Pro Seal LMAs 3,4,5</i>	<i>Manu-Jet Ventilator</i>
<i>Bougies</i>	<i>Porta View Batter Bronchoscope</i>

I would have thought in circumstances like those confronting Recovery on the morning of Saturday the 17 February 2001 when there was only one patient in recovery, but that patient had surgery of the type which would predispose him to an airways compromise situation, the airway resources trolley could be relocated in Recovery.

I note the recovery area now has provision for an appropriate capnograph for each physiological monitor in its bays. In addition there is now a redirection of funding to fibre optic bronchoscopes and video bronchoscopes. I would hope the

streamlining of the availability of mechanical assistance for assessment of successful intubation would not confront a doctor or registrar with a series of confidence-eroding occurrences.

### **PROFESSIONAL SUPPORT**

In addition the availability of ICU care would seem to be an issue. At the time the deceased's airway compromise became critical he should have been in a high dependency unit. It was ultimately the consultant from ICU who established a functioning airway. It was not Dr McGrath, the equivalent of Dr Thornton in ICU, who resolved the situation, but Dr Edibam.

While I accept he had not just suffered the confidence - eroding occurrences Dr Thornton had been subject to, one does wonder how much more quickly the airway problem would have been resolved if the deceased had been on monitors in the ICU. The elapse of time was ultimately the reason for the deceased's inability to independently sustain life.

It became apparent during the inquest that what I intend to call "mind set" can play a significant part in response to an emergency situation. It became obvious most anaesthetists are not practised in cricothyroidotomy although it is an airways

issue. If they do need to undertake one in an emergency situation their preference would be for use of a needle cannula rather than a scalpel and endotracheal cuff. Anaesthetists are used to needles, surgeons are used to scalpels. This very basic difference in confidence in handling specific items of medical equipment can affect what I term “mind set”.

Dr Thornton had at least practised on goats. Evidence was heard at the inquest most anaesthetists never practise on anything more than a plastic mannequin. Dr Riley indicated it is possible to cause serious harm when performing a cricothyroidotomy. Apparently the trachea has a relatively slippery surface in a living patient. Located each side of the trachea, although at a deeper level, are the carotid artery and jugular vein. Consequently one can understand a physical hesitation when attempting a cricothyroidotomy in an emergency situation.

Unfortunately in a major teaching hospital each discipline has a fairly narrowed and specialised area of responsibility. Those practicing in these institutions are unlikely to experience with regularity the broader emergency situations facing doctors in more regional situations. This may compromise the speed with which an emergency is acted upon. One has to consider there was an inadequacy of professional support for Dr Thornton in the emergency with which she was faced. The emergency

called only reached a narrow-discipline field. It would have been more appropriate for it to reach a wider range of skills.

The benefits of the deceased's recovery in a high dependency unit such as ICU were recognised by Dr Thornton but due to the lack of beds he could not be accommodated until later in the afternoon. That turned out to be a fatal contribution to the circumstances of the deceased.

While I accept the deceased did not present as high risk, the location of his infection and therefore surgery were in a critical location. This was recognised and perhaps should have alerted the system to the fact patients such as the deceased need to be in an area used to handling an emergency resuscitation.

I do not know how one provides experience in these types of emergency procedures. Experience hopefully overcomes the "mind set" which may resist the actual physical action required in an emergency. Dr Thornton knew what she had to do but was unable to achieve it successfully. Dr Edibam had performed the procedure before, although not in an emergency situation, and experienced no difficulty. One can only assume his "mind set" was positive, both from experience, and from the fact he had not just been involved in a series of critical time-delays eroding his confidence. Consequently the aspect of

training the inexperienced to become experienced, to assist in confidence, is something which needs to be addressed. I do not know if there are situations which could be used, under the supervision of someone who has had experience, to train anaesthetists and intensive care registrars in these life saving emergency procedures.

I am satisfied from evidence given at the inquest attempts have been made to minimise the occurrence of the events which contributed to the delay in establishing a functioning airway in this case.

I am, however, concerned overstretched resources would still not accommodate patients', in the deceased's circumstances, appropriately in high dependency units (ICU).

## **RECOMMENDATIONS**

Patients who have had infection and surgery in the vicinity of their airways be:

- Monitored as to their O<sub>2</sub> saturation levels at all times.
- Positioned in proximity to an expired CO<sub>2</sub> monitor which is functioning and user friendly at all times.

- Placed in a unit with immediate access to surgical intervention if it becomes necessary

until such time as it is clinically likely the infection is under control.

EF VICKER  
***DEPUTY STATE CORONER***

August, 2003