FORM 37

Rule 60(1)

FINDING INTO DEATH WITH INQUEST

*Section 67 of the **Coroners Act 2008***

Court reference: 2539/05

Inquest into the Death of TIMOTHY JACK WOOD

Delivered On:	8th December, 2009
Delivered At:	Melbourne
Hearing Dates:	16th to 20th March, 22nd and 23rd April, 4th and 5th June, 2009
Findings of:	IAIN TRELOAR WEST
Representation:	Mr C. Winneke for family
	Ms F. Ellis for Austin Hospital
	Mr P. Halley for Royal Children's Hospital

Place of death/Suspected death: Royal Children's Hospital

Assistant:	Sergeant D. Dimsey
	Leading Senior Constable K. Taylor

FORM 37

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FINDING INTO DEATH WITH INQUEST

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Court reference: 2539/05

In the Coroners Court of Victoria at Melbourne
I, IAIN TRELOAR WEST, Deputy State Coroner

having investigated the death of:

Details of deceased:

Surname: WOOD
First name: TIMOTHY
Address: 13 Bransgrove Street, Preston

WITH inquest held before Coroner Drake at the Coronial Services Centre, Southbank on the 16th March to the 20th March and at Melbourne Magistrates' Court, Melbourne on the 22nd and 23rd April and at the Coronial Services Centre, Southbank on the 4th and 5th June, 2009
find that the identity of the deceased was TIMOTHY JACK WOOD
and death occurred 19th July, 2005

at Royal Children's Hospital

from
1a. CEREBRAL ANOXIA.
1b. CARDIAC ARREST.
1c. BRONCHIOLITIS AND BRONCHOPNEUMONIA (INFLUENZA A)

in the following circumstances:

INQUEST PROCESS

1. The Coroners Court is different from other courts as the proceedings are inquisitional rather than adversarial. In other words, there is no trial, with a prosecutor and a defendant. Instead, there is an inquiry that seeks to find, as far as possible, the facts surrounding a person's death; to establish what happened rather than who is to blame. In order to do so, the coroner must contain the investigation and subsequent findings to those matters which fall within a description of being proximate to, and connected to, the death.

BACKGROUND

2. Timothy Wood was born on the 11th December 2003, and was nineteen and a half months of age at the time of his death. He had been born premature but had been developing normally with no major medical issues. Timothy had a past medical history that included current immunizations and bronchiolotis and he lived with his parents, Robyn and Anthony Wood, and his four year old sister, Holly, at their home in Preston.

CIRCUMSTANCES

First Hospital Presentation

3. On the 15th July, 2005, Timothy presented by ambulance to the Emergency Department of the Royal Children's Hospital with his mother at approximately 5.00am. Timothy's father arrived shortly thereafter. Timothy had developed a cough on the 14th July that worsened overnight causing him to wake the next morning at about 4.00am, distressed, coughing and with expiratory stridor. Observations recorded by ambulance personnel were temperature 38.7, heart rate 180, respiratory rate 48 with increased effort and upper airway stridor (croup cough).

4. Upon admission, he was triaged ATS (Australasian Triage Scale) category 3 (medical assessment within 30 minutes), with his observations showing a reduction in respiratory rate to 35 and oxygen saturation of 100% on room air. Timothy was seen promptly by Dr. Jeremy Rosenbaum, the resident medical officer, who took a history of runny nose and cough for a week, with the cough changing into a loud, dry "barking" cough overnight. On examination, Timothy was found to be distressed, with some soft stridor at rest and normal lung fields on auscultation of his chest. Dr. Rosenbaum described him as not looking systemically unwell and was of the opinion that he was well hydrated. He observed mild intercostal recession upon breathing. Following a diagnosis of croup, oral prednisolone and panadol were administered at 5.20am, both at appropriate doses for his weight, and he was observed over a two-hour period during which time his condition considerably improved. Timothy had been playing in the play area with his parents and subsequent assessment found that his stridor had resolved, his heart rate had reduced to 150 and his respiratory rate was 25. The decision was made to discharge Timothy home with prednisolone medication.

Second Hospital Presentation

5. On the 16th July, Timothy re-presented to the Emergency Department shortly before 1.00pm, as his parents were concerned that he was not getting better. This was stated to the primary triage nurse, together with the fact that he had been diagnosed at the hospital the previous day, as having croup. At triage he was assessed as ATS category 4 (semi urgent; medical assessment within 60 minutes), with the assessment notation being "alert and cooperative, smiling and interacting with staff, pink, warm, dry skin, pink and moist mucous membranes, warm peripheries, mild UOAM (use of accessory muscles) on ventilation, nil inspiratory or expiratory stridor at rest, croupy cough heard." Having then provided clerical details it was necessary to wait for a secondary triage, with this involving a further nursing assessment at a triage cubicle. However, the hospital records indicate that the family did not attend for secondary triage when called at 1.45pm, 2.15pm or at 3.55pm. Accordingly, it was assumed that the family had decided to leave before being seen.

6. Later in the day, Timothy's parents believed his condition was continuing to deteriorate and, hence, rang the 24-hour Maternal and Child Health Line, a service staffed by qualified maternal and child health nurses. Upon speaking to the family and hearing Timothy's breathing difficulties in the background, the nurse advised the family to call an ambulance for transfer and admission to hospital. In addition, it was advised that Timothy would be staying overnight and that they should prepare themselves accordingly. Ambulance officers attended the residence at 5.47pm and were given a history of severe shortness of breath, an increase in distress and croup like bark.

Examination found a:

> "Glasgow Coma Score (GCS) of 15/15; pupils equal and reacting to light; heart rate 134; increased distress; respiratory rate 40 with normal effort and rhythm; nil tracheal tugging; nil accessory muscle use; upper respiratory tract croup like bark; nil wheeze; good air entry to bases; child appears tired and intermittent croup/bark present".

The examining officer's initial and final assessment was croup.

Third Hospital Presentation

7. It was suggested that due to diversions being in place at the Royal Children's Hospital (there is no clear evidence of the need for bypass), Timothy was transported to the Austin Hospital where he arrived and was triaged shortly after 6.00pm. At triage a history was taken and it was recorded that he was alert and interactive, having no rib retraction, no tracheal tug and with a respiratory rate of 40 and pulse rate of 134. A triage category 3 was given and at approximately 6.20pm a cubicle assessment was undertaken by Registered Nurse Jan Bye, with observations recorded as temperature 37.9, pulse 134, respirations 40 and oxygen saturation of 97% on room air. The following assessments were recorded:

> "alert, grizzly, with coarse breathing on inspiration, slight rib retraction, nil tracheal tug, well perfused, hot to touch, temperature 37.9, nil gastrointestinal issues voiced by mother, nil loss of appetite, decreased fluid intake since 12.30 today, decrease in wet nappies from 4-5 to 2-3 today, skin intact."

A sketch of the lungs accompanied the respiratory assessment, with the sketch showing dots and crosses over the right lung and at the top of the left lung.

8. At 7.00pm, Timothy was examined in the presence of his parents by Emergency Medicine Consultant, Dr Robert Millar who obtained a history prior to undertaking his examination and who had a copy of the ambulance case sheet and the triage form containing the cubicle nurse assessment. He noted that Timothy had been diagnosed with croup two days earlier and that he was experiencing increased cough and shortness of breath. Examination by Dr Millar revealed a "barking cough, mild subcostal recession when distressed and no stridor" and that Timothy appeared to be well hydrated and that auscultation of his chest revealed no added sounds. Dr Millar diagnosed a viral upper respiratory infection complicated by mild croup and ordered 10mg prednisolone and period of observation in the Emergency Department in order to monitor any change in his condition. Upon review at 8.20pm, Timothy was sleeping on his mother's shoulder, with no evidence on examination, of intercostal recession, stridor, or wheeze. Dr Millar concluded that the clinical findings were all consistent with mild croup and that there were no signs of respiratory illness that would suggest the need for hospital admission. The management plan was for Timothy to be discharged home, to continue the predisolone the next night and to be reviewed by his general practitioner the day after.

9. After returning home, his parents set up a vaporizer, however it was not effective. During the evening, Timothy's breathing was noted to be laboured and he was given approximately 150ml of milk before the family retired to bed for the night, however, his mother was up regularly due to his frequent waking and distress. At around 9.00am his temperature was recorded at 39.5 C and he was given a bath, with his father noticing that his muscle tone felt limp and without strength, however, the muscle tone returned at the completion of the bath and he was able to sit up. His temperature was again taken and as it had dropped to 35 C and as he was more settled, his parents thought he was "on the mend" and put him to bed for a rest, but stayed close

by to monitor him. Shortly before 1.00pm and after realizing he could not hear Timothy's "troubled breathing", his father went to him and found him not breathing and pulseless, leading to ambulance assistance being immediately requested and mouth to mouth resuscitation being undertaken pending arrival.

Fourth Hospital Presentation

10. Prompt ambulance response had Timothy being assessed 6 minutes after dispatch, with MICA paramedics arriving 2 minutes later. Timothy was in cardio-respiratory arrest with a GCS of 3/15, resulting in resuscitation protocols being implemented, including drug therapy and intubation, before transporting him to the Royal Children's Hospital and his admission to the Emergency Department at 2.00pm. Auscultation of the chest by the ambulance officer found equal air entry to lungs and following a repeat of the procedure by an ICU nurse in the Emergency Department, a notation was made of "equal chest rise, good chest sounds". Subsequent auscultation of his chest by an Emergency Department medical officer found the "chest clear with equal air entry". Following admission to the Intensive Care Unit, the first recorded note of crepitations is made ('air entry to bases, some creps'), following auscultation of the chest at 9.30pm. Despite appropriate intensive care management, Timothy's grave condition failed to improve over the next 48 hours, with there being no return of neurological function. Brain death was subsequently confirmed at 4.00pm on the 19th July, 2005.

CAUSE OF DEATH

11. An issue raised at the inquest, concerned the nature of the pathological process that caused the cardiac arrest. Was it upper respiratory tract infection (laryngotracheo-bronchitis due to influenza A virus) or lower respiratory tract infection (bronchiolitis and bronchopneumonia due to influenza A virus)?

Post Mortem Examination

12. On the 21st July 2005, an autopsy examination was performed by Paediatric Pathologist, Dr Peter Campbell, who found the cause of death was cerebral anoxia, caused by a cardiac arrest, that in turn was caused by bronchiolitis and bronchopneumonia secondary, to influenza A infection. Dr Campbell stated in a report to the coroner,

> "Influenza A virus can be a fatal infection in the young and the very old and the pathology of the lungs in this child's case was extremely severe with extensive plugging of the bronchioles as well as early bronchopneumonia. I am not in a position to be critical of the Austin Hospital's decision to send the child home, which could well require statements from the people concerned. When back home, however, the child did seem to improve after a bath and some fluids and the parents felt he was 'on the mend.' This would suggest that the decision by the hospital to send him home was reasonable. However, the child was obviously much sicker than either the hospital or the parents realized."

13. During the course of the inquest, a report was sought by the solicitors acting for the Austin Hospital that further examines the cause of death. The report was provided by Dr Johan Duflou who holds a number of professional appointments, including Chief Forensic Pathologist of the Department of Forensic Medicine in Sydney. Dr Duflou was provided with all relevant material, including the microscopy slides and was asked to provide his opinion as to the cause of the cardiac arrest. His report in part states:

"In my opinion, Timothy's major clinical problem on 15 and 16 July 2005 was that of upper airways obstruction as a result of croup. The clinical features were consistent with the diagnosis (croupy cough and stridor), treatment appeared to be at least partially effective for the condition, and there was no clinical evidence of lower respiratory tract involvement (normal air entry and no indication of crackles on auscultation).

At autopsy in this case, the upper airway findings are those of necrotising upper respiratory tract damage, with associated metaplasia of the epithelium and mucus gland hyperplasia, all indicating an upper respiratory tract infection of at least several days duration, and consistent with the clinical history provided of croup of about a weeks duration. On the other hand, the autopsy findings in relation to the lower respiratory tract show involvement predominantly of the airways (bronchi and brochioles) and relatively lesser and more recent involvement of the pulmonary parenchyma in the form of a necrotising pneumonia. Again, this would be consistent with the clinical history provided of clear lung fields initially, followed by a rapid onset fulminant pneumonia.

Pneumonia in cases of influenza can be due to direct viral infection of the lungs, secondary bacterial infection, or a combination of the two processes. Influenza pneumonia is well-known as having the capability of being rapidly progressive over a short time period, and it is not uncommon for a patient to be described as not being significantly ill one day and being desperately sick the following day. In this case, there is no histologic evidence of bacterial pneumonia and this is supported by the lack of growth on bacterial culture of lung tissue.. On the other hand, influenza A virus is detected within lung tissue on PCR testing and microscopic changes seen are consistent with that expected of a severe case of fulminant pneumonia.

In my opinion, it is likely that the patient's predominant clinical problem in the time leading up to his arrest was one of upper respiratory tract infection, presumably caused by influenza A virus infection. At that time, there was little if any clinical evidence of a lower respiratory tract infection and it appears likely that pathologically at that time there would have been relatively minor lower respiratory tract involvement by the infective process.

I therefore conclude that the pathological process leading up to the cardiac arrest and subsequent hypoxic brain damage was primarily the result of laryngotracheo-bronchitis (croup) very likely caused by influenza A virus infection. In my opinion, the lower respiratory tract infection (pneumonia and bronchiolitis) progressed rapidly following the child's second admission to the Royal Children's Hospital, and did not appear to be a significant medical problem at the time of his cardiac arrest."

Dr Duflou recommended that the cause of death be modified to the following:
1(a) Anoxic brain damage
1(b) Cardiac arrest
1(c) Laryngotracheobronchitis (Influenza A virus)

14. Whilst Dr Duflou's review is of probative value, I do not see a need to change the cause of death as stated in Dr Campbell's post mortem report. Dr Campbell is a very experienced paediatric pathologist and having performed the examination, is in the best position to establish the pathology that led to the death.

PARENTAL CONCERNS

15. Submissions made by Mr Winneke of Counsel on behalf of the family, raised no issues regarding the appropriateness of care and attention Timothy received during the course of his first and fourth hospital presentations. Regarding the second presentation, Mr Winneke submitted that the standard of treatment Timothy received at the Royal Children's Hospital fell below that which was reasonable. Similarly, the standard of treatment provided at the Austin Hospital by Dr Millar at the third presentation was inadequate and fell below the standard to be expected of a reasonable medical practitioner of equivalent experience and qualification. Mr Winneke further submitted that these inadequacies in treatment were causally related to Timothy's death.

Evidence Regarding Second Presentation

16. The evidence indicates that Mrs Wood presented with Timothy at the triage station while Mr Wood, in company with his daughter, arranged car parking. Mr Wood subsequently arrived and gave evidence that he heard the completion of a conversation between his wife and a person whom he believed was a triage nurse. Mr Wood was unable to identify this person and Mrs Wood did not give evidence at the inquest, a decision that attracts no adverse inference. Mr Wood stated that whilst he wasn't involved in the conversation and that he had come in at the tail end of it, he remembered reference to a vaporizer and that the nurse had tried it on her two boys and that it had been effective. In a statement prepared prior to the inquest and from what he learnt from his wife, Mr Wood stated:

> "The nurse basically said to my wife that what was prescribed to Timmy last night and the treatment regime was correct; we needed to line up on the second line and then wait our turn to go through. The nurse also said that the doctors will do the same as last night and indicated it is fruitless waiting, but if we wish we are most welcome to do the second line wait and see the doctor."

On being told this and after looking around and seeing 20 to 30 people waiting, the decision was made not to wait and the family left the hospital.

17. The on-duty primary triage nurse was Ms Natalie Barty, a Registered Nurse (Division 1) since 1991. She had been employed in the area of emergency nursing since 1993 and involved in triaging since 1994, after undertaking specific triage education. RN Barty had been employed in emergency paediatric care at the Royal Children's Hospital since 1998. In her evidence she explained the triage process and that families had interaction with staff, other than the triage nurse. She stated that when families asked about leaving, her practice was to advise them to stay, since ".... you're concerned enough that you're presented to the emergency department, to be seen by a doctor." RN Barty denied stating that the treatment likely to be given would be the same as that given the previous night; that she has never had a vaporizer and would not recommend its use and that she had two children, a boy and girl.

18. I am satisfied that RN Barty did not advise the family to use a vaporizer, nor convey by words or actions, that waiting to be seen by a doctor would be futile. I further find that RN Barty discharged her duties in a competent and responsible manner.

19. I am satisfied that a conversation as stated by Mr Wood did take place with a staff member and that it's not a fabrication, or based on a misunderstanding. The evidence reveals that the child health care nurse, when contacted later in the day on the 24 hour health line,

recorded that she was told the parents had been advised to return home rather than wait and that Timothy had not been seen by a doctor. The advice of it being fruitless to wait was clearly inappropriate, with the adviser requiring counselling if she could be identified. I do not accept, however, Mr Winneke's submission that this episode was causally related to the death. Speculation is unhelpful as to what the outcome might have been, had the parents not left the hospital and Timothy had been seen by a doctor. In addition, the act of leaving was not sufficiently proximate to the death to be causative of it, given that Timothy was subsequently discharged home following his third hospital presentation, that included a medical officer's assessment.

Evidence Regarding Third Presentation

20. Mr Wood stated in his evidence that he was not present when his wife and Timothy arrived at the Austin Hospital, as he had arrangements to make with his in-laws, that included them looking after Holly. His arrival time of around 6.30pm is consistent with him not being present for the ambulance hand over and triage and with him arriving after the cubicle assessment undertaken by RN Bye. On arrival he observed Timothy's breathing to be noisy and his throat was still sucking in, as were his stomach and ribs. After his arrival he said a nurse came in, followed by a doctor, with a request being made that they calm Timothy down. Mr Wood gave a detailed history as he is "aware how critical it is for doctors to have full information in order to make a proper judgement." The history included reference to the previous hospital presentation, the advise of the maternal health nurse regarding admission, the reduction in fluid intake and the medication administered. In addition, Mr Wood pointed out a swelling at Timothy's neck, which he described as approximately 10cm in length and 12mm in width, however, he stated that the doctor didn't seem concerned about it. Timothy was having trouble breathing and after the history was given, Mr Wood could not recall whether Dr Millar felt Timothy's body after the nurse had asked for his upper clothing to be removed. There was trouble placing the oxygen saturation probe and getting a reliable reading, with the level stated to be 93% (I satisfied this reading was inaccurate; 97% was subsequently recorded). He said that the doctor could have been present for up to 10 minutes, with there being no use of a stethoscope during that time. Mr Wood went on to state that the doctor confirmed croup and said he would arrange for the nurse to give prednisolone, which he believed was given at about 7.00pm.

21. At the time of discharge, Mr Wood stated there had been a small improvement in condition but his son was still distressed and was having difficulty breathing. As he was lying against his mother he could not see if there was sucking in at the throat or tummy, but he could hear him having trouble breathing. Timothy was irritable and not sleeping. Mr Wood said that Dr Millar did not use a stethoscope to examine the chest and remained adamant, that he never saw one used at the hospital. During discussion of the discharge plan, Mr Wood reiterated his concerns regarding Timothy's distress and expressed his understanding, reinforced by his earlier discussions with the maternal health nurse, that Timothy would be admitted. He told the inquest that in his opinion, Dr Millar "just basically wanted us out the door".

22. Dr Millar stated in evidence that at 7.00pm he examined Timothy with his parents giving a history regarding breathlessness, cough, hospital attendance, diagnosis and medications. He said that he didn't recall seeing a band at Timothy's neck, or recall Mr Wood drawing his attention to it, but given its description, he believed it unlikely to be related to a respiratory problem. Timothy was noted to be breathless and distressed with coughing, a very typical barking cough which is typical of croup. On initial examination, auscultation of his chest did not reveal any added sounds, with there being no stridor, wheeze or crepitations. He stated that 40 breaths per minute was not high for a child of Timothy's age, with 30 to 40 being the normal range. He could not recall asking RN Bye what the sounds she heard were like, but stated that

when a patient was presenting with a cough, several potential diagnoses had to be considered. These are asthma, croup, pneumonia and bronchiolitis, with his assessment being that Timothy had a viral upper respiratory infection, complicated by mild croup. Dr Millar did not consider pneumonia or bronchiolitis a differential diagnosis, as there were no clinical indications of either. He explained that there were no specific guidelines for children at the Austin Hospital presenting with croup, but there was a link to the Royal Children's Hospital in order to access their guidelines. He elected to keep Timothy in the Emergency Department for a period after giving a dose of prednisolne, in order to ensure there was no deterioration, or new features of the illness developing. Dr Millar explained that upon presentation, no chest x-ray was conducted because for a child of Timothy's age, you need a very reasonable clinical suspicion of pneumonia and on his evaluation that was very unlikely. His judgement was a presentation with upper respiratory tract illness and that the observations had been relatively normal.

23. Upon review at 8.20pm, and when asleep on his mother's shoulder, he was able to lift up the top of his clothing and examine his breathing. Dr Millar stated that he had a specific recollection of conducting auscultation on this second occasion and that there was no intercostal recession and no stridor, or wheeze. The fact that Timothy was lying against his mother did not prohibit access for assessment, or opportunity to observe. Dr Millar did not recall the parents raising significant concerns at time of discharge and stated that there were no signs of respiratory illness of a severity that would suggest the need for admission, or alternative therapy.

24. Dr Millar told the inquest that he had his formal qualifications conferred in 1993 and his fellowship conferred in 2003. He had trained and worked in the field of Emergency Medicine for nine years and had a special interest in paediatrics. He explained it was always his practise to examine the chest and to draw in all the available information, with that being the history, ambulance assessment, triage and cubicle assessments. There was a need to observe the chest and auscultate the chest before coming to a preliminary diagnosis, with him in this case having a heightened level of caution, due to there being prior treatment, ambulance transfer and parental concerns.

25. The evidence as to whether or not Dr Millar performed auscultation of the chest using a stethoscope prior to discharge, is contradictory, with the doctor saying he did and Mr Wood saying he did not. The evidence is clear that auscultation of the chest should be a fundamental part of the examination of a child presenting with upper respiratory tract infection. I cannot accept that a consultant would fail to perform such a basic and crucial procedure, especially where the child has represented, and accordingly, find that Mr Wood must be mistaken as to his memory, or observation. This would have been a distressing time for both parents and a time to be easily distracted by a sick child. There appears to be some doubt in Mr Wood's mind as to whether he was in attendance at the cubicle assessment undertaken by RN Bye, or whether Dr Millar felt Timothy's body at the time of assessment. His evidence is also at odds with the assessment of the ambulance officers regarding neck sucking in and effort with breathing. The neck sucking in was said to be ongoing during the assessment by the cubicle nurse and by the doctor, yet neither noted what must be regarded as a critical sign in a child representing with croup. I am not confident that Mr Wood's recollection in the circumstances, is accurate and accordingly, I accept the evidence of Dr Millar as to assessment and his observations of Timothy immediately before discharge.

EXPERT EVIDENCE

Dr John Raftos

26. Dr Raftos is a Senior Specialist in Emergency Medicine at Sydney Hospital and was requested to provide an opinion in this matter, by the solicitors acting for the family. He told the inquest that Timothy should have been admitted to hospital on 15th or 16th July. Initially he was of the view that hospitalization would have prevented the outcome, but conceded that hospital mortality for croup is in the order of 2% and 5% for influenza A. He went on to state that viral illness causing croup will generally last 3 to 5 days and at the outside, 10 days. That the actual croupy cough is present for 24 hours which is an opinion arguably contradicted by various guidelines including "Kids, Health Information" put out by the Royal Children's Hospital, that appears to refer to it lasting 3 to 4 days. In his evidence Dr Raftos agreed that course breathing is not synonymous with crepitations, and that bronchopneumonia can have rapid onset and progress quickly.

27. Dr Raftos stated that as this was Timothy's third presentation, on this basis alone he should have been admitted and that it was his practice to almost always admit a child on second presentation. Dr Raftos conceded, however, that it wouldn't be 100% of the time and on hearing the Royal Children's admission rate on re-presentation was 25%, accepted that there is room for discretion and that the clinician who has the child and parents before him is in the best position to make the decision.

Professor George Braitberg

28. Professor Braitberg is currently employed at the Monash Medical Centre and was prior to that appointment, Director of Emergency Medicine at Austin Hospital. He provided an opinion at the request of the solicitors acting for the Austin Hospital. Professor Braitberg stated that from the notes, Timothy was not sufficiently unwell to warrant being kept for a longer period of observation and that if a child is able to sleep, its a good indication that they are breathing well, as children fighting for breath do not go to sleep. He believed in all the circumstances it was appropriate for Timothy to be discharged, noting that there was no material difference between his vital observations when he left the Royal Children's Hospital and when they where taken at triage and in the cubicle at the Austin Hospital. Professor Braitberg would prefer to have seen more observations, but observed that the discharging clinician was a senior clinician who had reviewed the child. In circumstances where the same person who assesses the patient on arrival, is the same person who discharges the patient, there is a degree of 'interrelated reliability' in the process. "It is important to note that an experienced emergency physician who is the person who sees the patient at the beginning and also sees the patient at the end, is the most qualified person to actually detect a trend, a change"

29. Professor Braitberg told the inquest that Dr Millar's diagnosis of mild croup made on his first assessment of Timothy, was consistent with his noting a barking cough, mild subcostal recession when distressed, with no stridor and having auscultated the chest. Ambulance notes made about half an hour before Dr Millar's assessment, he said were consistent with the assessment of not finding any respiratory sounds or lung sounds. In addition, it was appropriate to repeat the prednisolone whilst in the emergency department, given that it had been commenced on the 15th at the Royal Children's; that Timothy had taken another dose later that day and that he had yet to be given his dose for the 16th. This management was entirely appropriate as croup extends over several days and up to a week.

30. In regard to RN Bye's markings all over the right lung and over the top of the left, Professor Braitberg stated that in the context of normal vital signs, it would be inconsistent for these to be identifying sounds of consolidation, given the record by the ambulance officer half an hour earlier of good air entry to bases. He went on to state, that when weighing up the experience of a junior nurse and an experienced emergency physician, the auscultation experience of the emergency physician in hearing the appropriate sounds, far outweighs that of the junior nurse. From 8.20pm, when Dr Millar found the lungs were clear, to the time of arrest at approximately 1.00pm, pneumonia can commonly develop in children within that time-frame and in addition, can develop while children are in intensive care.

31. At the point of triage, Professor Braitberg was critical of the fact that complete vital signs were not taken, noting that respiratory rate and pulse were taken, but neither temperature nor pulse oxymetry were taken. Vital signs were important as they are all part of "drawing a picture", with the expectations that positive and negative findings be documented, for example 'no crepitations or lungs are clear' should have been recorded. Professor Braitberg was complementary of the cubicle nurse observations (RN Bye), stating that they were good and complete.

Dr Tony Joseph

32. Dr Joseph is an Emergency Physician at Royal North Shore Hospital, Sydney. An independent opinion was requested by the State Coroner's Office (as it then was) from the Australasian College for Emergency Medicine as to Timothy's management, with the opinion subsequently being provided by Dr Joseph. He told the inquest that in his opinion there did not appear to be definite indications for admission, according to croup management guidelines, at the 2nd or 3rd presentations. Nevertheless, with parental concerns, Dr Joseph stated he would tend to admit if presenting for the third time. He was of the opinion that whether or not admission was strictly indicated was irrelevant, as "the emphasis should be that parental concern and re-presentation should set off some 'warning bells' that admission may be required. Admission to hospital may not have resulted in any immediate change in management or the eventual outcome...but there may have been less likelihood of hypoxic brain injury in association with an initial cardiac arrest".

33. He stated that it was necessary to listen to the chest and for crepitations or rales in the lung fields, with these being different sounds to what you hear with croup. Any evidence of the inflammation of the upper airways spreading down to the lower airways to cause bronchiolitis would be a cause of concern. In respect to the sounds heard by RN Bye, he explained that on listening to the chest you can sometimes hear transmitted sounds which come from the upper airways down to the lower airways. He described rales or crepitations as "added extraneous noises in the lower region of the chest" and said he wouldn't expect a change in the half hour from ambulance assessment (good air entry to bases, i.e clear air entry in all parts of lung field) to the nurse hearing course breathing, equating to bronchiolitis.

34. In his report, Dr Joseph stated that whilst discharge may have been appropriate, the decision was unclear for four reasons.

> Firstly, on the point that no observations were performed prior to discharge. On being reminded that it was recorded that Timothy was sleeping with no stridor, he agreed that for an experienced clinician at point of discharge, one should be able to tell whether a child is breathing within the normal range by observation.

Secondly, there being no assessment of fluid intake. Dr Joseph would have been more comfortable with knowing what the fluid intake had been over the attendance period of one hour twenty minutes and whether Timothy had passed any urine. He was reminded that the consultant indicated in his statement that he had noted Timothy's fluid intake had been reduced in the six hours prior to presentation, but that there had been no loss of appetite. Dr Joseph's response was that "I accept that if they thought the child's hydration was OK, then he made a clinical decision to release the child which is fair enough, but I don't think he was able to support that with any objective evidence..."

Thirdly, Dr Joseph had the impression that the assessment "appears to have been done by an RMO and not the original examining doctor", however, he was reassured on being told that an emergency medical consultant undertook both of the examinations.

Fourthly, he was concerned that there was no documentation of assessments or instructions given to parents. The evidence indicates, however, that a notation was made that Timothy was sleeping with no stridor; that the plan was to continue prednisolone the next night, and there was to be a review next Monday. The evidence also reveals that the parents had the Royal Children's Hospital fact sheet with Dr Millar having gone through it with them, discussing the signs and symptoms that would cause the child to represent.

Dr Andrew Maclean

35. Dr Maclean is an Emergency Physician, and Director of the Emergency Department at Box Hill Hospital and was requested to provide an opinion by the solicitors acting for the Royal Children's Hospital. Dr Maclean stated that it was clear Timothy's condition had progressed to pneumonia at the time his parent's found him in cardiac arrest. He believed that the underlying virus was influenza A and that it caused both the croup and the bronchopneumonia. Further, it was possible that the bronchiolitis and pneumonia developed after discharge from the Austin on the 16th, just as it may have developed before. However, in his opinion, the predominant clinical picture was still one of croup at the time of presentation to the Austin Emergency Department and that there was nothing in his presentation that mandated his admission, or indicated a potentially more sever form of disease. This opinion was based on Dr Millar having found no abnormality on auscultation. He stated that not to auscultate the chest would be below acceptable standards for a physician and he went on to state that the sounds heard by RN Bye could have come from numerous conditions, including the upper airway, or an obstruction. He noted that Timothy was alert but grizzly, with barking cough on examination, no stridor and with mild sub-costal recession when distressed, all of which he said were symptoms consistent with mild croup. He further stated that Timothy developed a rapidly progressing and severe form of infection for which hospital admission may or may not have changed the final outcome. He disagreed with other expert evidence (Dr Raftos) that Timothy should have been admitted on the 15th or 16th, and that admission would have prevented the fatal outcome.

CONCLUSIONS

36. There are a number of issues about which all experts are in agreement. All were highly critical of Dr Millar's failure to appropriately record his findings with respect to auscultation and hydration and I'm satisfied his failure to do so, was a departure from acceptable standards. There were no repeat vital observations, which reflects that observations were not regularly monitored or recorded. This criticism is justified, despite evidence that repeat clinical observations by an experienced clinician are equally if not more important than objective recordings. Nevertheless, I accept the submission made by Ms Ellis on behalf of Dr Millar, that it cannot be said, that had

vital observations been regularly taken and recorded, they would have revealed a picture that contradicted Dr Millar's assessment, given the findings on chest examination taken by other practitioners following his assessment and Timothy's discharge. The clinical and post mortem evidence is consistent with a finding that Timothy suffered a rapid onset fulminant pneumonia.

37. In my view there can be no comfortable satisfaction that crepitations (being highly indicative of bronchiolitis/bronchpneumonia) were present on the 16 July. Dr Millar stated that he found the lungs clear. The clinical findings support this conclusion, with the auscultation by the ambulance officer on the 16th finding "good air entry to bases"; by the ambulance officer on the 17th finding good and equal air entry, right and left; by the ICU nurse in the Emergency Department at the Royal Children's finding "equal chest rise, good chest sounds"; by Dr O'Brien finding "chest clear with equal air entry" and on entry to ICU, "chest right and left equal". The evidence of Dr Duflou is supportive of this finding. In addition, the evidence does not support a finding that the course breathing heard by RN Bye were crepitations or rales, with the sound being heard on inspiration and described by her as unusual, but not 'crackles'. I am not satisfied there were clinical signs of bronchiolitis and/or bronchopneumonia present on the 16th July.

38. Each of the experts agreed, that ultimately, the decision to admit was a clinical decision to be made by Dr Millar. Professor Brietberg believed 'it was appropriate for Timothy to be discharged'; Dr Maclean found 'nothing in his presentation to mandate admission'; Dr Joseph was of the opinion 'there did not appear to be definite indications for admission' and Dr Raftos, despite being of the view that a second or third presentation should have resulted in admission, conceded that there was room for discretion and that 'the clinician who has the child and parents before him is in the best position to make the decision'. On the evidence before me, it cannot be said what difference admission on the 16th would have had to the tragic outcome. I do not accept the submission made by Mr Winneke on behalf of the family, that Dr Millar's conduct fell below the standard expected of competent medical practitioners practicing in emergency medicine.

COMMENTS:

Pursuant to section 67(3) of the **Coroners Act 2008**, I make the following comments connected with the death :

1. The inquest highlights the importance of complete vital signs being regularly taken and that they be recorded. In addition, regular visual observation is all part of 'drawing a picture' in order to ensure the well being of a patient through appropriate management. Neither occurred during this presentation. Regrettably the omissions are not unique to this case, as I have frequently had cause to adversely comment on this issue in the eighteen years I have sat in this jurisdiction. It is a frustrating, recurring theme. Medical and nursing schools, together with directors of medical and nursing services within the hospitals, must remain vigilante in reinforcing the importance of undertaking these tasks.

2. The Royal Children's Hospital has put in a variety of measures to reduce failure to wait rates including the setting up of a GP clinic at the hospital which in the year following Timothy's presentation, reduced the rate from 6.3% in the year of his death, to 3.7%.

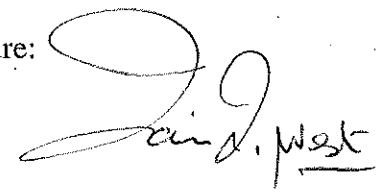
3. On behalf of the family, Mr Winneke invites me to consider recommending for Victorian Hospitals, the adoption of croup clinical practice guidelines as prepared by the New South Wales, Department of Health. The publication, "Acute Management of Infants and Children with Croup" has been prepared by an expert clinical reference group under the auspice of the Statewide

Paediatric Steering Group. The document makes it clear that it should be used as a guide, rather than a complete authoritative statement of procedures to be followed in respect of each individual presentation. Whilst I am prepared to make this recommendation, I do so in the absence of knowing whether similar guidelines are already in place in Victoria. I do not have this information, as I was not the coroner involved in the investigation of Timothy's death.

RECOMMENDATIONS:

Pursuant to section 72(2) of the **Coroners Act 2008**, I make the following recommendation connected with the death:

1. That the Department of Health give consideration to preparing and disseminating clinical practice guidelines, similar to those available in NSW, for placement in all hospitals and facilities likely to be required to assess or manage children with acute croup.

Signature: 

Date: 8 / 12 / 2009

DISTRIBUTION

- Family of Timothy Wood
- Dr Robert Millar, Emergency Medicine Consultant
- Director of Medical Services, Royal Children's Hospital
- Director of Medical Services, Austin Hospital
- The Secretary, Department of Health, Victoria