THE OFFICE OF THE CORONER
AT CHRISTCHURCH
(In Chambers)

IN THE MATTER of the Coroners Act 2006

AND

IN THE MATTER of an Inquiry into the
death of [infant]

Before: Coroner Richard McElrea

Date of Findings: 11 November 2009

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FINDINGS OF CORONER
Introduction

[1] Infant], aged 3 years, died on 2 December 2007 at his home at [address] Street, [Region]. The Findings are to be read in association with Certificate of Final Findings, under section 94, Coroners Act 2006.

The evidence

[2] I have considered all available evidence including:

- Police report to Coroner (POL 47)
- Post-mortem report of Dr Barry Berkeley Pathologist,
- Medical report, 2 December 2007, Dr [general practitioner], [Medical Clinic, [Region], and medical notes
- Medical report 14 December 2008, Dr Philip Jacobs (consulted as an expert) and e-mail in response to Dr [general practitioner]'s letter of 3 March 2009.
- Statement of Constable [ ] of New Zealand Police [Region] and attachments thereto, including statements from [grandmother] (grandmother), [nurse] (registered comprehensive nurse)

[3] At the age of five days [infant] (who I will refer to as [infant]) had the first of multiple operations comprising open heart repair for an interrupted aortic arch, hyperplastic aortic annulus and ventral-septal defect. At his latest cardiology review in November 2006 he was noted to have good cardiac function and to be running around like any other toddler. A pan-systolic murmur was present and echocardiography indicated aortic valve regurgitation (incomplete closure to backflow) and stenosis or constriction as well as some pulmonary valve regurgitation. However the ventral-septal defect was not patent, function was excellent and it was felt that he need not be seen for a year and that the next surgery might be delayed for two to three years. He also suffered from sensorineural deafness of about 90%. He used hearing aids when it suited and the
paediatrician felt that progress and development was normal on assessment in August 2007.

[4] Leading up to his death he had been unwell for about a week. [Infant]'s mother, [mother], brought him to the surgery on Wednesday 28 November. The practice nurse states: "Kelly told me that [infant] had been well up to three hours previously and then she had noticed that he was blue around the lips and that he had become very cold. [infant] had then become very hot and flushed and so she had brought him to the surgery". The reference to three hours is also in the clinical notes completed at the time. The practice nurse assessed him. He was hypersensitive to her touch. His temperature was recorded as 39.8 and his cheeks were flushed. His heart rate was 120 beats per minute. These were both above normal and of concern to the practice nurse. Some 15 minutes after arrival he started to vomit.

[5] Dr [general practitioner] assessed him an hour later when the doctor became available. He noted from the history given of the episode that had resulted in [infant] being brought to the doctor, there had been no loss of consciousness, no tongue-biting or incontinence. He did vomit but then seemed much better. Dr [general practitioner] noted he did not seem especially hot, was co-operative and interactive. After examination Dr [general practitioner] did not feel there was any indication for bacterial infection. He felt he had probable viral gastroenteritis and postulated this had caused a brief diversion of blood to the bowel with subsequent general hyperaemia. Dr [general practitioner] discussed these results with the mother. The doctor's impression was that he did not have any worsening of his heart condition or status. He returned home with continuing paracetamol.

[6] [mother] telephoned on Saturday 1 December to say that he was again unwell and complaining of "tummy ache". She did not want a consultation but wondered if anything might help. Dr [general practitioner] suggested a trial on fennel or gripe water and said to let him know if there was no improvement. [mother] called back in the late afternoon and Dr [general practitioner] visited at about 7.00pm. [infant] was unwell and a little listless. Dr [general practitioner]
carried a full examination. He noted, "Was hot, probably pyrexial (feverish), chest clear full air entry, ears clear, abdomen actually soft and non-tender although has been apparently quite drumlike earlier in day. No rash, no meningism and well hydrated". In his immediate report to the Coroner dated 2 December 2007, Dr [general practitioner] stated, "he was hot and we discussed the option of transfer to hospital at some length. The difficulty was to decide whether the diarrhoea etc was a symptom of a general viral illness or whether bowel infection was the cause of this condition; if the latter whether it would be viral or bacterial". Dr [general practitioner] said he would visit another patient and in the meantime [infant] would have a tepid bath or shower, as it seemed likely that settling his temperature would improve his symptoms. The doctor telephoned [mother] about 9.00pm and the mother told him that he had settled and slept since the bath, apart from awaking twice briefly and indicating his head. Dr [general practitioner] encouraged [mother] to contact him if he seemed to change or become non-responsive. Dr [general practitioner] wondered whether the variation in between abdominal and headache symptoms might indicate childhood migraine, possibly precipitated by a viral illness.

[7] Dr [general practitioner] was contacted by a neighbour of [mother] at 9.45am the following morning. [infant] was still unwell and would the doctor visit. Dr [general practitioner] indicated he might be about an hour. The neighbour called again in about two minutes suggesting urgency and Dr [general practitioner] said an ambulance should be called. He subsequently learned that he had suddenly become stiff, unconscious and blue. Dr [general practitioner] attended. Ambulance crew were undertaking resuscitation. Dr [general practitioner] said that [infant] was a charming little boy who will be deeply missed.

[8] The post-mortem examination showed that death was due to septicemia caused by a Group A beta haemolytic streptococcus. Dr Berkeley explained that Group A beta hemolytic streptococcus is a highly virulent organism capable of causing septicaemia and death. The septicemic illness has caused peritonitis and secondary portal pyemia. He noted there was a preceding episode a day or so before death or either cardiac arrest of very severe hypoxia.
[9] I obtained expert opinion from a general practitioner's perspective, from Dr Philip Jacobs of Christchurch. Dr Jacobs advises:

[infant] was a 3-year-old boy who lived with his Mother and Grandmother. He had an extensive past history of congenital heart disease and a profound sensori-neural deafness. His heart disease had been repaired on a number of occasions and included the insertion of an aortic root homograft in May 2005. He had undergone cardiology review in November 2006 and at that time was thought to be doing well with good cardiac function. Further surgery would probably be required within the next 2-3 years. He was due to be reviewed again sometime around the end of 2007. His deafness was managed with hearing aids but he was reluctant to use them. I understand he could talk and could communicate reasonably.

[10] Dr Jacobs summarised the events immediately preceding [infant]'s death, and continued:

This case is one where a relatively healthy child became very ill over a period of five days and subsequently died as a result of the disease process. He presented in an atypical way with an acute\(^1\) event and his condition seemed (based on the information at hand) to fluctuate over the five days. It would appear that Dr [general practitioner] assessed [infant] in an appropriate manner on at least two occasions and communicated over the phone four times.

Nevertheless the serious nature of his illness remained undiagnosed and sadly that led to his death.

Gp A beta haemolytic streptococcus in its invasive form (1) has a high mortality rate and the various treatments that are available appear not to reduce that rate. Underlying chronic illness (2) appears to predispose to fulminating infection.

In General Practice it is rare to see cases of overwhelming infection and it usually confined to cases of Meningococcal meningitis, pneumonia or urinary sepsis. The vast majority of illness presenting with a fever in a child is due to a viral illness and usually supportive care only remains the correct management.

\(^1\) As recorded elsewhere in these Findings, [mother] presented some three hours after the event. Dr [general practitioner] did see him, and within an hour of being requested to do so. Dr Jacobs has no issue with this.
I believe there were factors that contributed to a failure to diagnose this illness in [infant] which are emanating from both patient and Doctor

Patient

1. He presented in an atypical way
2. He appeared to have fluctuating symptoms
3. His deafness may have contributed to difficulty interpreting signs and symptoms
4. The examination findings appear to be out of keeping with the severity of the illness

Doctor

1. Failure to act on the awareness of increased caution required when dealing with someone with extensive congenital heart disease.
2. Failure to appreciate the severity of the initial episode (which may have resulted in a significant hypoxic insult to the brain)
3. Not recognizing that the increasing anxiety from family was an indication of deteriorating condition
4. Not being aware of the implications of a child with known cardiac disease still having a high fever five days after presentation

Although in the end the cardiac disease had no effect upon the illness, it would be fair to say that had Dr [general practitioner] embarked upon a search for endocarditis by obtaining a blood culture, he would have come across the bacteria concerned in the blood stream, thereby enabling urgent treatment. He also should have checked the child’s urine (he may have done this but not recorded it in the notes) and initiated other searches for a source of sepsis.

The assessment of a sick child may be difficult. Where it appears that clinically the situation is confusing or unclear, a Doctor needs to utilize all the information that is available to him/her to get a clearer picture. Where communication issues, such as that seen in small children or children with disabilities, interfere with assessment, then the Doctor needs to perform further examinations which includes blood tests, X Rays and urine examination. If these cannot be organized in an effective and timely manner then admission to the secondary care centre should be arranged.
Living in a rural town may sometimes act as a deterrent to admit children but an admission where the illness turns out to be viral imposes minimal trauma compared to failing to diagnose serious illness.

Dr [general practitioner], through his letter, appears to be very caring and deeply saddened by the death of [infant]. He was attentive and did try to care for his patient. He was unfortunate that [infant] developed such a rare and dangerous illness in the presence of fluctuating and atypical signs. Nevertheless a role of the General Practitioner is to detect serious illness and in this respect, and with obvious retrospect, he failed to do this. Prospectively, there were aspects that could and should have been managed differently. I suspect Dr [general practitioner] will be his own harshest critic in this regard.

[11] Dr [general practitioner] accepts that the expert opinion from Dr Jacobs is fair and reiterates good advice. Dr [general practitioner] fully accepts the opinion "but would once again also refer to factors relating to [Infant]'s mother?“ and in particular the fact that she did not seem to express increasing anxiety which should have alerted me to his deteriorating condition. I do accept that I may not have been receptive to all signals which she gave out, but it is also significant that on at least two occasions she reassured us that [infant] had improved, and I did feel that she was reluctant that he be admitted to hospital. However, I clearly contributed to this situation by failing to recognise [Infant]'s poor condition and yet still providing a sufficient degree of reassurance that it seemed reasonable to continue with home care.”

[12] Following this death Dr [general practitioner] reported the death to the Medical Council of New Zealand, the Ministry of Health and ACC. He took part in a formal Critical Incident Analysis through his practice following Ministry of Health recommendations as part of the Ministry’s audit process for significant event management. The meeting was also attended by Dr Hayman (Collegial Supervisor) Dr [X] (newly arrived from England) and the practice owner and manager.

\[mother\] acted at all times in an appropriate manner and in the best interests of the child. Nothing in these Findings or in Dr [general practitioner]'s comments or Dr Jacobs' opinion suggest otherwise.
Best practice advice was taken from the document "Feverish Illness in Children" produced by the United Kingdom National Institute of Clinical Excellence and was furnished by Dr [X]. It may be accessed at www.nice.org.uk/Guidance/CG47.

Initial baseline assessment of adequate airway, breathing, circulation and level of consciousness. Consider the possible source of infection. Measure and record temperature, heart rate, respiratory rate, lymphadenopathy, capillary refill and assess the extremities and skin turgor (latter three all to consider dehydration). Decide whether the condition is immediately life-threatening by assessment of skin colour, (including the lips), response (time to respond and form of response), increased respirations beyond 40 per minute, hydration, fever for more than five days, refusal or inability to weight bear and signs of acute respiratory distress such as noisy breathing, indrawing at the ribs as well as excluding meningism. If immediately life-threatening transfer to hospital, if for ongoing home care a "safety net" should be provided indication of specific symptoms to look for, contact details and methods and arrangement for follow-up. Do NOT give antibiotic for pyrexia of unknown origin. When considering the need for transfer to hospital, consider also the social situation, other illnesses, parental anxiety and instinct, illness contacts, repeated parental calls, the family's prior experience of illness and the time for which the child has been unwell with a five day pyrexia being especially significant.

Dr [general practitioner] acknowledged deficiencies particularly in not admitting the infant to hospital and set out subsequent actions he has taken. Dr [general practitioner] has special interest in occupational and aviation medicine and provided an analysis of causative factors similar to that used for accidents. It is necessary to consider errors of perception, intention and action; also organisational, situational and individual factors.

Dr [general practitioner] set out his suggested recommendations.

A “template” approach to assessing patients with fever, especially children, to include recording of temperature, heart rate, respiratory rate, capillary refill, lymph node status as well as seeking sources of infection. I believe it is
important to retain a sense of responsibility for the assessment and advice, even if a patient or guardian subsequently chooses not to accept that advice. Trust one's instinct. Avoid overload by restricting work to planned hours only. Lower the perceived threshold for referral to secondary centres.

[16] Dr [general practitioner] noted that in undertaking the Critical Incident Analysis it was also observed that, despite the guidelines on best practice, the recording of all the points recommended does not occur universally or even commonly at present. Dr [general practitioner] states that this may be an indication that a wider reminder to all practitioners is warranted, although for his part he can say that he now always assesses and records these points.

[17] Dr [general practitioner]'s very professional response following the death of this infant concludes with the following statement. "I have been practising for 20 years and have never had a similar incident before. Indeed, I recalled some good intuitive diagnoses (especially for children) which were doubted by others but subsequently proven. I would like to think that the chance of any recurrence is remote, especially considering the refinements to my practice and reduction in hours."

[18] Pursuant to Section 57 (3) of the Coroner's Act 2006 I will request the Ministry of Justice to refer these findings, with the certain details removed to

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The Royal New Zealand College of General Practitioners
P O Box 10440, Wellington 6143
with the recommendation that publicity be give to best practice concerning the treatment of feverish illness in children, as highlighted by this case.

[19] I will also request the Ministry of Justice to refer these findings, to the Medical Council of New Zealand (as a follow-up to Dr [general practitioner]'s reporting of
the incident to the Council) and with certain details removed to the Office of the Health and Disability Commissioner, for information.

[20] I have, under section 74 of the Coroners Act 2006, prohibited the making public of the following:
   The names and address (including reference to [Region]) of the deceased infant, and of his mother.

Finding
[21] I find that:
[infant], an infant born 17 November 2004, late of [address], [Region], died at his home on 2 December 2007, the cause of death being septicaemia caused by a Group A beta haemolytic streptococcus, with massive intra-abdominal lymphadenopathy and sepsis, including portal pyemia, on a background of congenital heart defect.

Conclusion
[22] On behalf of the Coroner’s Court I extend my sympathy to the family of [infant] for their loss.

Signed at Christchurch, this 11th day of November 2009

Coroner Richard McElrea