OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Ryan Charles Saunders**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Rockhampton
FILE NO(s):	COR 4449/07(0)
DELIVERED ON:	07 October 2011
DELIVERED AT:	Brisbane
HEARING DATE(s):	19 July 2011, 19 – 22 September 2011
FINDINGS OF:	Mr Michael Barnes, State Coroner
CATCHWORDS:	CORONERS**:** Death of a child, Rockhampton Base Hospital, appropriateness of medical care, policies and procedures

REPRESENTATION:

Counsel Assisting:	Mr Peter Johns
Queensland Health:	Mr Chris Fitzpatrick (instructed by Corrs Chambers WestGarth)
Dr Nasreen Kamal:	Mr Andrew Luchich (instructed by TressCox Lawyers)
Registered Nurse Roslyn King:	Ms Cate Hartigan (instructed by QLD Nurses Union)
Dr Peter Roper & Dr John Evans:	Mr Geoffrey Diehm SC (instructed by Avant Law)

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The Coroners Act 2003 provides in s45 that when an inquest is held the coroner's written findings must be given to the family of the person who died, each of the persons or organizations granted leave to appear at the inquest and to various officials with responsibility for any issues that are subject of recommendations. These are my findings in relation to the death of Ryan Charles Saunders. They will be distributed in accordance with the requirements of the Act and posted on the website of the Office of the State Coroner**.**

Introduction

On 20 September 2007, Ryan Saunders was taken by his mother to his usual treating general practitioner who diagnosed him as suffering from mumps and recommended Nurofen and Panodol to help with his all over body pain.

After four days when he had not improved his mother called an ambulance to take him from their Emerald home to the local hospital. The doctors there were unable to diagnose his illness and he was medivaced to the Rockhampton Base Hospital (RBH) where various tests were undertaken to establish the cause of his pain.

Too late, it was realised he was suffering a florid infection and he died approximately 30 hours after being admitted to the RBH.

These findings:

- Confirm the matters required to be found by s45(2) of the Coroners Act 2003, namely the identity of the deceased, when, where and how he died and what caused his death;

- Critique the adequacy and appropriateness of the medical care provided to the deceased by the general practitioner who first saw Ryan; the medical staff at the Emerald Hospital and the medical and nursing staff at the RBH;

- Consider the adequacy of action taken by Queensland Health to address recommendations made by the Health Quality and Complaints Commission (HQCC) in its report dated 30 September 2009

The investigation

On 18 December 2007, pursuant to the authority vested in him by s164 of the *Health Quality and Complaints Commission Act 2006,* the Minister for Health directed the HQCC to investigate the quality of the health services provided to Ryan.

On 30 September 2009 the Commission's comprehensive report was completed. I am satisfied it is thorough and its conclusions are based on the advice of independent, appropriately qualified experts. Dr Roper's counsel submitted that its processes and conclusions were unfair to his client but as I understand it no action has been taken to vindicate these claims.

In any event, the statements, reports and other exhibits collated by the HQCC during the course of their investigation formed the primary source of information relied upon during the inquest and the experts quoted in the report were called to give oral evidence.

The inquest was provided with further material including statements from Dr Kamal and the ultrasonographer Mr Delaney and a further expert report pertaining to the adequacy of the treatment given to Ryan by his GP.

Queensland Health also undertook a root cause analysis of the circumstances of Ryan's death and the report was received into evidence.

The inquest

A pre-inquest conference was held in Brisbane on 19 July 2011. Mr Johns was appointed as counsel to assist me with the inquest. Leave to appear was granted to Queensland Health, Registered Nurse King, Dr Mercer, Dr Kamal and Dr Roper. An inquest was held in Rockhampton on 19 September 2011. Evidence was heard over four days; 135 exhibits were tendered and 11 witnesses gave evidence.

I turn now to the evidence. I can not, of course, even summarise all of the information contained in the exhibits and transcript but I consider it appropriate to record in these reasons the evidence I believe is necessary to understand the findings I have made.

Social history

Ryan Saunders was born on 9 December 2004 to his parents Donna and Terry. He was the second of their children and over the course of his short life resided with them in Emerald. Ryan was a healthy baby, who had no known allergies and took no regular medication. As at September 2007 Ryan had been taken by his parents to the local GP on several occasions with unremarkable presentations in the context of his subsequent sudden death. He had received all vaccinations recommended for a child of his age. The written evidence provided by Donna and Terry Saunders supported by photographs of Ryan indicate him to have been a happy and active toddler.

It is usual in the course of coronial findings to comment on the milestones of the deceased person's life; amongst other things, their education, employment, relationships and hobbies. That such milestones were not and will never be reached in the case of Ryan is just one reason why his death is so very sad. Later in these findings I will comment on the changes in procedures and infrastructure in Queensland Hospitals that can be directly traced to the circumstances of Ryan's death. The implementation of such significant changes appears to reflect a widespread recognition in the community of the enormity of Ryan's loss.

Despite its brevity, Ryan's life has left his parents, sister, grandparents and extended family with fond and lasting memories. I expect, though, that does

little to unburden them from the devastating sadness resulting from his untimely death and the circumstances in which it occurred. I offer them my sincere condolences.

Visit to GP

Dr John Evans, an Emerald general practitioner, had seen and treated Ryan on numerous occasions since his birth. On one of these occasions Ryan was administered the MMR (measles, mumps, rubella) vaccine.

Donna Saunders took Ryan to see Dr John Evans on 20 September 2007 due to her concerns about the enlarged glands on the side of his neck and his general unwellness.

Notwithstanding that Ryan had earlier been vaccinated, when he examined him on 20 September 2007 Dr Evans diagnosed him as having mumps.

He prescribed regular analgesia in the form of paracetamol while Ryan remained unwell and advised he should not attend child care for either nine days, or until the swelling had subsided. No follow up appointment was made and there was no further contact between Ryan and Dr Evans.

Adequacy of GP care

We now know Dr Evans incorrectly diagnosed Ryan to be suffering from mumps and did not arrange or suggest any follow up attendance. This prompts consideration of the adequacy of the care he provided.

The inquest heard from Dr Marion Woods, a specialist in infectious diseases. He advised the MMR vaccine is effective in 95.5% of cases. He also stated the incidence of mumps was relatively rare. He concluded mumps was an unlikely diagnosis in Ryan's case. He was otherwise complementary of the examination conducted by Dr Evans (which appropriately included a throat examination) and of the appropriate prescription of antibiotics when treating Ryan on previous occasions.

Dr Nicholas Stephens is an experienced general practitioner who provided an opinion on the adequacy of the medical care provided by Dr Evans. He agreed there could be little confidence in a diagnosis of mumps given its statistical improbability. He noted though, that Ryan's appearance was such that natural recovery could be reasonably assumed within a short period. Even though mumps was unlikely, Dr Stephens considered it would be reasonable for a practitioner in the position of Dr Evans to assume if Ryan was not suffering from mumps then the condition was one that was appropriate to treat with the same care plan over the short term. He saw no basis in the circumstances for Dr Evans to actively follow up Ryan's progress, it being reasonable for him to assume Ryan's parents would bring him back to the clinic or to hospital if the condition worsened. This of course is what occurred.

In a statement provided to the inquest Dr Evans explained he was able to exclude tonsillitis as an explanation for the swelling to Ryan's parotid gland. He said he was aware Ryan had been vaccinated but understood the 12 month seroconversion rate for the mumps vaccination was between 88% and 94%. Dr Evans says he was cognisant of the uncommon but serious complications of mumps, such as orchitis, meningitis and encephalitis and conducted physical examinations aimed specifically at excluding their presence.

Dr Evans noted his lengthy history of treating the Saunders family and was mindful Donna Saunders was a cautious mother who would be inclined to seek medical treatment for Ryan should she consider his condition had worsened. In any event he believes he advised Mrs Saunders to specifically watch out for changes in level of consciousness, neck stiffness, drowsiness or change in gait or coordination.

Although Dr Evans' diagnosis of mumps was unlikely to be correct in the circumstances, the treatment plan he set out for Ryan was appropriate for his presentation. There was no basis to expect Dr Evans to order pathological testing as at 20 September 2007. There is no evidence indicating the examination of Ryan was anything other than thorough. Dr Evans was entitled to expect Ryan's parents to take appropriate steps to have him re-assessed by a doctor should his condition worsen.

I am satisfied the steps taken by Dr Evans and the advice given amounted to adequate and appropriate treatment for a presentation that would have, in the great majority of cases, resolved itself over a reasonably short period.

Emerald Hospital

Donna Saunders told the HQCC investigators in the days after the visit to Dr Evans, Ryan ate very little and became increasingly listless. He had trouble sleeping and appeared to be more agitated and in more pain despite regular doses of Panadol, Nurofen and Painstop. At 1.00am on Monday 24 September 2007 Ryan appeared to be in a great amount of pain and was inconsolable. Mrs Saunders called for an ambulance.

Queensland Ambulance Service (QAS) officers attended the Saunders residence and Ryan was transported to Emerald Hospital Emergency Department, arriving at 1:35am. In the course of the journey the QAS recorded a brief history from Donna Saunders of the events of the preceding 72 hours.

On arrival at Emerald Hospital Ryan was triaged by two nurses who assessed him as 'category three' and completed an emergency flowchart. Ryan was seen by the on call doctor, Dr Annamalai at 3:10am. He was unable to find any signs to support a specific diagnosis but made a provisional diagnosis of "*lower respiratory tract infection/bronchitis"*. He admitted Ryan for observation and further evaluation. A chest x-ray and blood tests (full blood count, urea, electrolytes and liver function test) were ordered to be performed in the morning.

Ryan remained settled until about 5:15am when he began screaming and was given children's ibuprofen. His records show an entry at 7.00am "*Crying*+++."

At 9.00am Ryan was seen by Dr Mere Kende who considered him to be obviously unwell. He particularly noted that Ryan had his legs curled up into his abdomen and seemed to be in particular pain when his legs were extended. After examining Ryan, Dr Kende suspected intussusception, a condition whereby part of the bowel folds back inside itself leading to a bowel obstruction and/or ischemia. Dr Kende formulated a treatment plan that included an abdominal and chest x-ray, oral fluids (intravenous if not tolerated), analgesia, blood tests and four hourly observation be continued.

X-rays were performed at 9:19am and no abnormalities were identified. Between 10.00am and 10:30am Dr Werner Heidegger examined Ryan, having been asked by Dr Kende to provide a second opinion. Dr Heidegger considered Ryan to be acutely unwell. He performed a clinical examination for meningitis by checking for neck stiffness which was negative. Dr Heidegger formed the view Ryan's medical problem emanated from an abdominal source with intussusception being a strong possibility, although he could feel no mass in Ryan's abdomen, as one would expect with this condition.

At 11.00am Ryan was again seen by Dr Kende. A rectal examination was normal. Morphine was prescribed as Ryan had not settled and was still in pain after a further dose of ibuprofen. At 11:45am fluid therapy was commenced. At 12.00pm Dr Kende and Dr Heidegger had a further discussion and decided Ryan should be transferred to another facility where an abdominal ultrasound could be performed. An acute bowel condition, if that was the problem, could not be treated at Emerald Hospital in any event.

Accordingly, at 12:19pm Dr Kende contacted the paediatric department at RBH and described Ryan's condition to Dr Claradine Roos, a senior house officer, and asked if they would accept him.

She explained the situation to Dr Peter Roper, the paediatric consultant and director of the unit. Dr Roper told the inquest on the history related to him, and due to Ryan's age, he considered intussusception unlikely. However, he agreed to accept Ryan to the paediatric ward at Rockhampton. Dr Roos relayed this information to Dr Kende at Emerald.

Dr Kende made contact with the state-wide paediatric retrieval and coordination service, QNETS, and arranged transfer with the Royal Flying Doctor Service (RFDS).

At 2:41pm Ryan was transferred via ambulance to Emerald Airport, arriving there at 2:52pm. At 3:36pm the aero-medical helicopter departed Emerald with an intensive care paramedic on board. It arrived at Rockhampton at 4:34pm and Ryan was at RBH at 4:48pm. Before departing from Emerald Ryan had been administered morphine but continued to cry. The intensive

care paramedic noted that examination of Ryan's abdomen appeared to cause him a great deal of pain; recording it in notes as *"distress+++".*

Because of the suspicion of intussusception the medical staff on board the helicopter directed the aircraft to fly at lower than usual altitude. The QAS electronic report form stated the reason for transfer from Emerald Hospital was *"further investigation of queried bowel intussusception"*.

The transfer of Ryan had been arranged by the QNETS clinical nurse co-ordinator who put Dr Kende in contact with Dr Kevin McCaffery at the paediatric intensive care unit of the Royal Children's Hospital in Brisbane. Dr McCaffery then contacted Dr Roper. There is a discrepancy as to what was said in that conversation.

It is agreed both doctors considered the likelihood of a bowel intussusception to be low given the clinical information provided and Ryan's age. The discrepancy lies in whether it was held out to Dr McCaffery by Dr Roper that RBH was equipped to deal with an intussusception if in fact that was the problem. The hospital was not so equipped. Dr Roper says he had no reason to, and did not, suggest it was. Dr McCaffery says if he had known this he would have recommended Ryan be transferred directly to Brisbane.

Adequacy of care at Emerald Hospital

The medical practitioners of the Emerald Hospital were unable to diagnose the cause of Ryan's illness but they made a number of investigations and managed his pain with appropriate analgesia. They sought advice and assistance from a secondary hospital with a specialist paediatric unit and expeditiously arranged Ryan's transfer to it. Apparently accurate and complete records were kept of Ryan's condition and treatment when he was at Emerald and a copy was sent with the patient. A comprehensive referral letter was also sent.

None of the independent experts who reviewed this case had any criticism of the care provided at the Emerald Hospital. Most were very complimentary. I share that view.

Rockhampton Hospital: 24 September 2007

Ryan was admitted to the RBH emergency department (ED) at 4:54pm on Monday 24 September. The ED clinical record notes the presenting complaint as "*gastrointestinal with a referral from Emerald Hospital with viral illness possible intussusceptions accepted by Paed Reg"*.

Observations taken by nursing staff at 4:55pm were temperature - 38.7º; pulse rate - 162; respiratory rate - 28 and oxygen saturation - 95%. At 5:10pm his temperature had reduced to 38.4º and pulse rate was 152.

A nursing note indicates Dr Claradine Roos, a Senior House Officer in the paediatric ward, requested ED staff for *"baseline [observations] & manage pain"*.

Ryan was seen by ED locum registrar Dr Geoff Cashion at around 5:40pm. Dr Cashion considered Ryan to be in pain and ordered 150mg Nurofen and 50mcg Fentanyl; the latter described by Dr Cashion as an opiate commonly prescribed for severe pain in children. Ryan's temperature at 5:40pm (at around the same time Nurofen was given) was 38.3º.

Dr Cashion says he did not perform an examination of Ryan because it was already agreed he would be accepted by the paediatric ward.

Ryan's parents understood the primary purpose of Ryan being sent to Rockhampton was to enable an ultrasound to be conducted. Nursing staff referred their inquiries about this process to Dr Roos and it appears Dr Roos asked ED staff to organise the ultrasound.

Dr Cashion contacted Michael Delaney, one of the three sonographers based at RBH. All were off duty at that time but there was an arrangement in place for them to attend the hospital out of normal hours to conduct urgent scans.

Dr Cashion was left with the understanding Mr Delaney was unable to attend the hospital although there is no evidence either of the other two sonographers was contacted. Mr Delaney told the inquest there was a requirement that his attendance at the hospital out of hours be approved by a consultant in the relevant area of expertise (in this case paediatrics). It was clear to him this had not been done when Dr Cashion called. Mr Delaney says he made it clear he would be able to attend once he had such approval. He understood this approval was being sought and he would receive a second phone call once it was obtained. That call was never made for reasons that will become apparent.

Ryan's parents were told the ultrasound would not be happening immediately because paediatric staff wanted to review him first. Ryan was transferred to the paediatric ward at about 6.00pm. He was seen there by Dr Roos who noted from his clinical history, that Ryan had been irritable and suffered fever "*since Thursday*". Dr Roos' initial attempts to examine Ryan were made difficult because of his irritability. She noted him to be "*crying continuously"* at this stage. After waiting for a short period she says Ryan calmed somewhat and she was able to examine his abdomen while he was sitting on his mother's lap. She found this to be soft and not distended. Even at this point, though, Dr Roos was unable to properly examine Ryan's ears and throat. She wrote "*child is very irritable and doesn't want to be examined*".

However, Dr Roos did note meningism, Bruzinski sign and Kernig sign, all physical indicators of meningitis. Accordingly she concluded a test for this condition was essential.

Dr Roos contacted the on call consultant for paediatrics, Dr Roper. She summarised Ryan's history and her findings. She considered a lumbar puncture (the process of drawing cerebral spinal fluid - CSF) should be conducted. The testing of CSF would determine whether Ryan had meningitis.

Dr Roper agreed this was the appropriate course of action and agreed to attend the hospital to assist with the procedure. Dr Roper arrived at 7.00pm and attended on Ryan. Along with Dr Roos he examined the blood test results from the sample taken at Emerald. Dr Roper says nothing in the results caused him concern and, in particular, he noted Ryan's white blood cell count was normal. He was satisfied the apparent stiffness in Ryan's neck warranted the proposed lumbar puncture.

Dr Roper told the inquest he did not hear Ryan crying at this time. He did not consider Ryan to be in significant pain although acknowledged in his evidence he was unaware what pain relief medication Ryan had received to that point. He says he briefly palpated Ryan's stomach (although Ryan's parents do not recall this) and concurred with the view of Dr Roos that there was no sign of abdominal pathology. He had not read the medical chart from Emerald Hospital or the RBH ED, relying instead on the verbal briefing of Dr Roos and the referral letter written by Dr Kende. He does not recall being aware on that evening of Ryan having recorded a temperature of 38.7º or a pulse rate of 162 on arrival at the ED.

At 7.00pm Ryan's observations were temperature - 37.6º; pulse - 118; respiratory rate - 28; oxygen saturation - 94%.

The lumbar puncture was performed by Dr Roos with Dr Roper holding Ryan in place. Although the family had been warned the procedure may be painful, the use of local anaesthetic appears to have been effective and Ryan did not react to the needle. Unsurprisingly the process was nonetheless upsetting for Ryan's parents and Dr Roper noted that Terry Saunders, in particular, became upset during the procedure and left the room.

At the time the CSF was being withdrawn, Dr Roper noted it to be clear. This was a good, though not definitive, sign Ryan did not have a bacterial form of meningitis. Dr Roper says he had formed the opinion at this stage that Ryan was most likely suffering from a viral illness. He formulated a treatment plan with Dr Roos involving a continuation of fluids and analgesics in the form of paracetamol and Nurofen. This treatment plan remained in place when Dr Roper was contacted by Dr Roos at around 9:10pm to be told the test results on the CSF were negative for meningitis. Dr Roos did not speak to Ryan's parents about this result, leaving it to nursing staff to advise them. Ryan's parents say they were puzzled at that time as to why there was no further examination or testing of Ryan.

While he was still at the hospital Dr Roos asked Dr Roper whether he wanted her to arrange a blood culture. Recorded in the progress notes is the following notation on this point:

**No Blood culture done (d/w dr Roper: No need to do BC now)*

The lumbar puncture, performed at around 7:30pm, was the last contact Ryan had with doctors at RBH until 9:15am the next day. Regular nursing

observations throughout the night show a steady increase in Ryan's pulse up to a high of 175 at midnight, dropping to 137 by 4.00am but returning to 155 by 9.00am. At midnight the observation chart notes him to be crying and with a temperature of "*37?*". He was recorded as having temperatures of 37. 6º at 6.00am, 36.7º at 8.00am and 36 at 9.00am.

The HQCC report quotes from police interviews with Ryan's parents describing what from their perspective occurred after the lumbar puncture results had been returned. They were extremely concerned their son's pain was not managed appropriately:

> *As doctors, we would have thought that they would have had the interests of the patient at heart - that they would want to find the source of his pain - but apparently not - they were happy to let him cry in agony for hours, rather than do their job. For the rest of the night Ryan was left to cope with his excruciating pain and was only given Panadol and Nurofen.*
>
> *We also don't understand why, and the nurses didn't seem interested in following up with the Doctor to find out why Ryan couldn't have Morphine or something stronger than Panadol when it was obvious that he was in so much pain.*
>
> *Donna remembered there were three different nurses who came in to Ryan during the night, and she asked each of them the same thing "When can he get some more pain relief - or something stronger than Panadol?". She thought that if she asked a different nurse each time, maybe they would follow it up with the Doctor and get the Doctor to authorise something stronger - or at least the Doctor would come back in and take another look at Ryan.*
>
> *Why have a child who had previously been on Morphine, be taken off that drug and only given Panadol - when Panadol obviously wasn't doing anything for his pain relief.*
>
> *The whole ward could hear him screaming and no one cared. To see a child still in that much pain - surely that should have rung some kind of alarm bells, especially for paediatric medical staff…*
>
> *Terry arrived back up at the hospital at 7.40am. When he got out of the elevator on the Paediatrics floor, he could still hear Ryan screaming. He walked into Ryan's room and asked Donna "What's wrong - what did the Doctor's say". When Donna told him that Ryan hadn't seen a Doctor since the Lumbar Puncture, Terry was shocked. He went straight out to the nurse's station to ask when Ryan was going to see a Doctor – the response was "Doctors don't start their rounds until 8am*

A nursing note made at 6.00am recorded that Ryan had been "*Extremely irritable all night, not tolerating contact with staff. Arched posturing at start of shift….Having sips of H_2O."*

The morning of 25 September

From about 8.00am the following morning, Dr Roper led a chart review or "paper ward round" of all patients in the ward. Dr Nasreen Kamal, principal house officer and Dr Pauline Higgins, first year registrar also participated. Dr Roper informed the others of the circumstances leading to Ryan's admission, of the suspected meningitis and results of the lumbar puncture and advised he suspected Ryan had a viral illness.

After the chart review, the medical team went into the ward to commence a physical review of each patient. As usual they started with the patient in bed 1 but then went next to Ryan's bed, out of order and as a matter of priority, because Nurse Shirley Wood approached the doctors and told them Ryan appeared to be in pain and in need of prompt attention.

Dr Kamal conducted an examination of Ryan while Dr Roper observed and Dr Higgins took notes which indicated the examination was undertaken at 9.15am. It was agreed by the witnesses at the inquest that, although it was not included in the notes taken by Dr Higgins, Ryan's stomach was noted to be soft, and normal bowel sounds could be heard. Dr Kamal considered that Ryan was exhibiting some guarding as she examined his abdomen and she told the inquest he was crying in apparent pain as she did this. That Ryan was in pain at this period is also reflected in the notes of Dr Higgins. She recorded "*child in pain all* over" in the progress notes. Ryan's parents told the doctors he had not passed urine since the morning before, had not had a bowel motion for four days and had not walked for more than two days. Observations recorded in the note of Dr Higgins were a temperature - 36.7º, heart rate - 162, respiration rate - 34 and oxygen saturation - 94%.

Dr Roper says he noted Ryan's legs were "drawn up" as they had been the evening before and his condition appeared similar. At the inquest he acknowledged the heart rate of 162 was abnormal and could signify, amongst other things, the presence of infection and/or pain. In his interview with the HQCC he said Ryan was irritable but he did not consider him to be in a great deal of pain. He maintained in his interviews and at the inquest that he did not hear Ryan crying at this time, or in fact at any other time during his stay at Rockhampton. Despite this, at the inquest he acknowledged Ryan was evidently in sufficient pain to warrant the administration of morphine had he not been concerned the opiate may have masked symptoms necessary for diagnosis.

A scan of Ryan's bladder revealed 100-180ml of urine. A catheter was inserted with120ml of urine collected and sent for analysis to exclude a urinary tract infection as the cause of Ryan's illness.

During the early hours of the morning the IV cannula in Ryan's arm had "tissued" so it was no longer effective. At the 9:15am round Dr Roper says he asked Mrs Saunders how much liquid Ryan had consumed overnight and was told he had drunk around ½ a litre. Dr Roper was satisfied Ryan was taking in enough fluids by himself and decided not to have an IV line re-inserted.

Dr Roper considered Ryan's most likely diagnosis to be viral myosotis. He believed the source of Ryan's pain was likely in his limbs but he was unable to identify any particular source by pressing on Ryan's arms and legs. He ordered a check of Ryan's creatine kinase (CK) level through further analysis of the blood sample taken from Ryan at Emerald Hospital. This would confirm or exclude viral myosotis.

Dr Kamal suspected an abdominal source for Ryan's pain and when asked for a more specific differential diagnosis by Dr Roper she nominated retrocaecal appendicitis. It was agreed an abdominal x-ray and ultrasound be arranged to investigate this possible diagnosis.

The consistent evidence of Dr Kamal is that she suggested Ryan have blood testing in the form of a "toxic work up". This includes the growing of a culture from the sample and a CRP reading. This was to be followed on her recommendation by the commencement of IV fluids and antibiotics on an "empirical" basis (in essence antibiotics prescribed as a prophylaxis without a firm diagnosis of a bacterial infection). Dr Kamal told the inquest in her experience such a treatment plan was common practice in cases of suspected abdominal pathology. Dr Higgins said she presumed a blood culture would already have been sought. When asked why this was the case she told the inquest in her experience such testing was the norm in situations where a patient had a lumbar puncture and she was aware this procedure had been performed on Ryan around 14 hours earlier.

During his HQCC interview Dr Roper could not recall whether these suggestions were made by Dr Kamal at the 9:15am round. He told the HQCC investigators "*The plan that was formulated at 9:15 in the morning is what's indicated there in the chart*". At the inquest Dr Roper maintained he had no recollection of these recommendations being made by Dr Kamal but conceded they were having subsequently read the account of Dr Kamal in the HQCC report. Dr Roper told the inquest although he agreed to the ultrasound and chest x-ray he was not expecting to find anything. He said he was expecting a positive result from the CK blood testing and believed Ryan's symptoms arose from a viral illness. Dr Roper conceded he overruled Dr Kamal's suggestion that full blood tests be undertaken and IV fluids and antibiotics be given.

Dr Roper recalled Dr Kamal suggesting Ryan be administered morphine. He also refused this suggestion on the grounds it would mask the source of pain and this would make the diagnosis of Ryan's condition more difficult. Analgesics in the form of Nurofen and paracetamol were continued.

Dr Kamal discovered the diagnostic imaging needed to investigate the possibility of retrocaecal appendicitis could not be performed until 1.00pm because of the absence of a radiologist in the hospital until that time. Dr Roper was advised and indicated he was content with the timing.

At around 11.00am Drs Kamal and Higgins were approached by Nurse Wood who requested Ryan be given morphine. Nurse Wood told HQCC

investigators that Ryan was becoming increasingly agitated and Nurofen and paracetamol did not appear to be relieving his pain. Dr Kamal agreed to prescribe the morphine but was convinced by Dr Higgins to check this decision with Dr Roper given his earlier instructions. On telephoning Dr Roper, Dr Kamal was told morphine should not be given to Ryan. This was again on the basis it might mask the source of Ryan's pain and make diagnosis of his underlying condition more difficult. He did consent to the administration of the less strong pain relief in the form of Codeine. Dr Roper told the inquest although this too would have some effect of masking pain he thought it provided an appropriate balance between relieving Ryan's pain while retaining the prospect of using the presence and location of pain as a diagnostic marker.

At 11:20pm the result for the further CK blood test was noted in Ryan's chart. The CK level was normal and viral myositis effectively discounted as a diagnosis.

Ryan's medication chart shows he first received Codeine at 12:05pm.

Ryan parents considered he was not attended to with sufficient urgency. In an interview with police they said:

> *Given Ryan's condition and the distressed state he was in, we felt that he shouldn't have had to just wait around until 1:00pm, someone could have been called out to do the Ultrasound, especially if the Doctors were concerned enough about his condition and wanted to get answers.*
>
> *Terry* (Ryan's father) *mentioned to one of the foreign female doctors, that morning that we thought Ryan's condition was deteriorating and we were concerned that the constant pain and stress he was experiencing would surely be affecting his heart. When Terry said to her, "Look at my son! Is my son going to die or should we get him to Brisbane?" She smiled, gave a little laugh and said "Oh no, don't say that." It was as if we were the only ones with any real concerns for him and we were the only ones who could see that he was just completely exhausted.*

The afternoon of 25 September

At around 12:45pm Nurse Wood took Ryan to the diagnostic imaging department on a lower floor. Ryan was accompanied by his parents. The nurse and parents recall Ryan was crying loudly at around this time and it was clear to her the codeine was having little effect.

Nurse Roslyn King is an experienced paediatric nurse who had been due to start her shift at 3.00pm but had been called to start early because of the number of patients admitted to the paediatric ward. She told the inquest the first she knew anything of Ryan was as she walked from the lifts to the nursing station when she heard him "*wailing*". A short time after this she saw a clearly distressed Ryan being taken to the lifts by Nurse Wood.

Counsel for Dr Roper submits that Nurse King's description of Ryan's pain is unreliable because it is not consistent with some of the other witnesses and her account of when some of the incidents occurred does not fit within a timeline established by other evidence.

Ryan's x-ray was performed at 1.00pm. No small bowel obstruction could be seen. The ultrasound was performed by ultra-sonographer Michael Delaney soon after. A private radiologist Sandeep Joshi had come to RBH for a surgical meeting at 12.00pm and then attended on Ryan's ultrasound at 1:15pm after it had commenced. Dr Roper also arrived shortly after the commencement of the ultrasound in order to discuss the matter with Dr Joshi.

Mr Delaney told the inquest Ryan was "*moaning*" during the course of the ultrasound. Dr Roper, as with his evidence regarding all contact with Ryan, does not recall Ryan making any noises.

The ultrasound was ineffective due to the build-up of large amounts of bowel gas. Dr Joshi explained to Dr Roper that one of the reasons for this could be aerophagia which occurs when a child swallows large amounts of air in the course of crying. Dr Joshi also says he explained it could result from the process of the faeces distending the bowel and air pockets developing between the faeces. Dr Roper recalls the first of those explanations and was left with the understanding that although there was no sign of appendicitis, the result was not dispositive of the issue – the appendix had not been visualised. Dr Joshi suggested a CT scan be performed. Dr Roper agreed and contacted Dr Higgins to attend on Ryan to insert a cannula and inject contrast fluid to assist with the scan.

After his return to the paediatric ward, Nurse King conducted a physical examination of Ryan. She observed his abdomen appeared rigid and distended and he appeared to her to be inconsolable.

At the time she was contacted by Dr Roper, Dr Higgins was with Dr Kamal on the ground floor of the hospital performing an out-patients clinic. She returned to the paediatric ward and, with the assistance of Nurse King, inserted the cannula and contrast fluid. Dr Higgins said she took this opportunity to also take a blood sample which was then sent for a "toxic work up" among other tests.

Nurse King recalls the taking of bloods was raised by her as part of the normal checklist she would expect to raise with a doctor in those circumstances. Dr Roper told the HQCC and the inquest he had ordered Dr Higgins to take the blood sample. He says by that time he was aware viral myositis had been discounted and now knew the ultrasound was ineffective thus leading him to take further investigative steps. Dr Higgins told the inquest, when challenged, she was "80-90%" sure she had not received any direction regarding blood testing on Ryan from Dr Roper.

At the inquest Dr Roper gave evidence Dr Higgins had come into his office after she had inserted Ryan's cannula and contrast. He says she told him at this time she had taken bloods in accordance with his instruction. This meeting had not been mentioned previously by Dr Roper in either his statement or his more than 6 hour interview with the HQCC. It has never been mentioned in the various accounts of Dr Higgins.

Dr Higgins accompanied Ryan to diagnostic imaging for the CT scan which was conducted between 2:34pm and 2:40pm. Although Dr Higgins says she verbally stressed the urgency of the procedure and processing of results, the paperwork requesting the CT scan was not marked 'urgent'. Probably because of this it was not brought immediately to the attention of the radiologist Dr Joshi.

After Ryan was returned to the ward Nurse King became concerned he was not receiving adequate pain relief. At around 3.00pm Nurse King contacted Dr Higgins by telephone to request Ryan be given morphine. Dr Higgins told her Dr Roper had explicitly ruled out morphine earlier in the day and she was not in a position to prescribe it as a result. Accounts vary as to how Dr Roper became involved in this conversation but he was certainly called to the telephone by Nurse King in order to further discuss the issue of Ryan's pain relief.

Dr Roper told the inquest he understood, although he spoke on the phone to Dr Higgins, the request for morphine was being made circuitously by Nurse King. Dr Roper agreed to prescribe one dose of 2.5mg of morphine. He told the inquest he does not recall asking Nurse King any questions about the basis for her request and did not consider conducting a review of Ryan at this time.

It seems both Dr Higgins and Kamal in the outpatients clinic and Nurses Wood and King in the paediatric ward were regularly checking the Auslab pathology system for the return of Ryan's blood test results when they arrived at around 3:30pm. Dr Higgins and Dr Kamal say they were first struck by the urea and liver function tests which indicated Ryan to be significantly dehydrated. The only other result to stand out was probably the most significant, namely a C-reactive protein reading of 444mg/L. The normal reference range set out on the pathology results form is bounded by a maximum of 5mg/L. This was a non-specific sign of a serious infection. The inquest heard that, although it is non-specific, such a very high CRP figure indicates a bacterial rather than viral infection.

Dr Kamal and Dr Higgins were working with visiting paediatric consultant Dr Hilary Mercer in the outpatient clinic. Dr Mercer was the on call paediatric consultant for that day and as such was due to take charge of Ryan's care from 4:30pm. In the circumstances Dr Kamal decided to relate Ryan's history so as to provide a context for the blood test results she had just received and for the treatment plan she proposed. She says Dr Mercer approved this treatment plan. In addition to the triple antibiotics, Dr Kamal proposed a surgical consultation. Dr Mercer corroborates this version of events although

he recalls the conversation taking place by telephone after he had returned to the Mater Hospital at the end of the outpatient clinic. Dr Higgins agrees the treatment plan for Ryan was put to Dr Mercer before any discussion about the results was had with Dr Roper.

Ryan's fluid chart shows that a 250ml bolus of saline solution was administered by Nurse King at 3:30pm. This is consistent with that part of the treatment plan aimed at addressing Ryan's apparent dehydration.

Dr Kamal says she proposed "triple antibiotics" be given to Ryan as treatment for his suspected bacterial infection namely, Gentamicin, Metronidazole and Ampicillin. She ordered an immediate dose of Metronidazole, which was given at 5.00pm, to be followed by maintenance doses of all three. The Ampicillin was not given, because Dr Kamal changed the order to Ceftriaxone. Dr Kamal also ordered maintenance morphine be given PRN (as required).

Dr Higgins said she returned to the paediatric ward with Dr Kamal and then went to the office of Dr Roper alone. She told the inquest she told Dr Roper of Ryan's blood test results and advised him of the treatment plan already put in place. She says Dr Roper agreed with what was proposed.

Dr Roper gave a different account of this meeting. In his interview with the HQCC and in his statement he said he believed it was Dr Kamal who came to see him to recount the results of Ryan's blood test. At the inquest, and having by then read the accounts of the other two doctors, he accepted it was in fact Dr Higgins who came to see him. He did, though, maintain his account of what was said. Dr Roper said he was not told about Ryan's abnormal liver function and urea results and only recalls the CRP result. He said he ordered the administration of triple antibiotics and he nominated the three drugs given. Dr Roper also said in the course of the afternoon, during discussions with Dr Kamal, Dr Higgins and the on-call Dr Tait, he ordered a nasal gastric tube be inserted and a surgical consultation be arranged. He also said he instructed Dr Kamal and Dr Higgins to give Dr Mercer a full account of Ryan's history and condition by way of handover.

This evidence is unable to be reconciled with that of Dr Kamal who said she never spoke to Dr Roper about any matter that afternoon after returning from the outpatient clinic. She said she chose the specific antibiotics to be administered, she ordered the nasal gastric tube be inserted and she attempted to contact the surgical registrar, Dr Catherine Prather, to organise a surgical consultation. She found the surgical team in preparation for surgery and left an urgent message for Dr Prather to contact Dr Tait.

The evidence of Dr Roper differs from Dr Higgins with respect to the meeting at 2.00pm in that Dr Higgins recalls no instruction from Dr Roper to brief Dr Mercer.

Dr Tait, in her lengthy interview with the HQCC makes no mention of any conversation with Dr Roper that afternoon.

In view of Dr Roper's concession that he is mistaken about who he spoke to and what they told him, I conclude the version of the two female doctors is more reliable and should be preferred over Dr Roper's wherever they conflict.

The nasal gastric tube was inserted by Nurse King at 4:30pm. It resulted in the forceful return of gastric bile and some dark stained fluid. Dr Kamal was there to observe this process and it was shortly after this she attempted to organise the surgical consultation.

Drs Roper, Higgins and Kamal were due to finish their shifts at 4:30pm but it seems all stayed until around 5.00pm. Nearing that time the results of the CT scan had still not been received and only after follow up from Dr Higgins was it discovered, for the reasons set out earlier, the images had not been sent to Dr Joshi. This was done immediately and Dr Joshi examined them before contacting Dr Higgins shortly before 5.00pm. He advised there was some free fluid in the abdomen and some collapse at the base of the lungs but otherwise the scan was non-specific. After a discussion about this result with Dr Kamal it was agreed a portable chest x-ray should take place. This was to investigate the possibility of a lung infection. Dr Kamal filled out the medical imaging request form for this, marking the document "urgent".

Dr Kamal briefed Dr Tait by way of handover. In the course of this she introduced Dr Tait to Ryan's parents, explained that the portable chest x-ray had been ordered as had the surgical consultation and said she would need to discuss the results of the x-ray with Dr Mercer. Neither doctor said Dr Roper was involved in this handover process.

As previously mentioned, the first of the antibiotics prescribed for Ryan was given at 5.00pm. Nurse King explained the apparent delay from when they were prescribed was the result of her having to insert the nasal gastric tube and prepare the diluted antibiotic IV solution amongst other tasks in an extremely busy ward.

Retrieval Team and Ryan's death

At 6.00pm Dr Tait had received the results of the chest x-ray and had obtained some further information from Dr Joshi with regard to his analysis of the earlier CT scans. She rang Dr Mercer to inform him of what were, again, non-specific findings. She did not tell Dr Mercer about the gastric bile return on insertion of the nasal gastric tube assuming Dr Kamal had already passed this information on. Dr Tait said she does not recall Ryan crying during her observations of him but he was continuously moaning. Dr Mercer instructed Dr Tait to ensure Ryan was continuing to receive the triple antibiotics and adequate pain relief. He also instructed her in relation to the insertion of an in-dwelling catheter although it is apparent this had already been done by Nurse King on the instruction of Dr Kamal.

Dr Mercer told the HQCC he understood Ryan was at this time "obviously a very sick child" and instructed Dr Tait to contact him in 30 minutes for a further update. At around 6:30pm Dr Tait was called to an emergency in an operating theatre which meant this update was not forthcoming.

Dr Prather emerged from the operating theatre at around 6:30pm to find the note left for her by Dr Kamal. She and the Director of Surgery Dr Neil Scholes conducted a surgical review of Ryan. Dr Scholes believed Ryan needed an exploratory laparotomy. This procedure requires a specialist paediatric anaesthetist or paediatric intensive care specialist to assist during and after surgery. He called on anaesthetic consultant Dr Melanie Nicholson to review Ryan.

Dr Nicholson told the HQCC when she entered Ryan's room he appeared pale and dehydrated, his eyes were sunken and although conscious he appeared "beyond the point of complaint". She recalled Ryan's parents were both crying and his grandfather appeared distraught. She said she immediately recognised that Ryan was very ill. She told Dr Scholes she considered him to be far too ill to undergo surgery and said in her opinion he needed to be transferred to Brisbane urgently.

Dr Scholes then contacted the QNETS coordination service and contact was made with the paediatric registrar at the Royal Children's Hospital (RCH) in Brisbane. They had no hesitation in accepting Ryan for transfer.

Dr Tait received a number of urgent messages for her to return to the paediatric ward. The messages were sufficiently urgent that she did not change out of her theatre scrubs before returning. She says on returning she thought Ryan looked considerably worse than when she had last seen him around 15-20 minutes before. She noted his capillary refill had extended to four seconds from only two when she had last tested it shortly before being called into surgery. This indicated to her his circulatory function had deteriorated significantly in that short period.

Dr Tait contacted Dr Mercer, who had not yet reviewed Ryan, to update him on the results of the surgical review and asked him to attend the hospital. Dr Mercer contacted QNETS at 7:10pm from home and discussed the matter with Dr McCaffery in Brisbane. Dr McCaffrey rang back at 8.00pm to confirm the retrieval had been booked.

The RFDS retrieval team left Brisbane airport at 9:06pm and arrived at RBH at 10:45pm. A clinical handover meeting was conducted by Dr Mercer and Dr Tait. Dr Lesley Cupitt, an intensive care registrar at the RCH, was rostered as the on-call registrar for retrievals. She recalls on examination of Ryan at 10:52pm being surprised by how ill he was and the interventions already in place. She considered his physical condition to be extreme, he was rocking side to side in bed and he responded only to pain. She does not recall him making a sound but recalls his breathing was laboured and uncoordinated.

Dr Cupitt formed the view Ryan would need to be intubated and ventilated in order to allow safe transport to Brisbane. A decision was made to do this in the paediatric ward rather than the intensive care ward due to the availability of paediatric staff and equipment. The on-call anaesthetist Dr John Thomson

was called to assist although he acknowledged at the time he had very little paediatric experience.

An initial attempted intubation was unsuccessful and the endotracheal tube was positioned in Ryan's oesophagus. The tube was removed and Ryan provided with oxygen and then monitored for several minutes. Dr Cupitt then attempted to intubate Ryan at 11:28pm and was successful. Dr Mercer confirmed there was good air entry straight away. An x-ray was called to confirm correct placement but almost immediately after this Ryan suffered a cardiac arrest.

Resuscitation efforts commenced. Dr Mercer performed cardiac massage and Dr Cupitt administered inatropes. At 11:40pm a medical emergency team (MET) call was made resulting in the arrival of an ED consultant and registrar.

Resuscitation attempts continued until after midnight with additional injections of adrenaline, saline and glucose. At around 12:05am on 26 September 2007 Donna Saunders was brought into the room to observe the extent of the resuscitation attempts. CPR and chest compressions were continuing and by 12:15am had continued for 45 minutes. At that time there had been no improvement and it was decided by those present that CPR would be ceased. Ryan was declared deceased by Dr Mercer. Donna Saunders was left to be with her son. Ryan's father and grandfather had left some hours earlier in order to drive to Brisbane in the expectation they would meet there with Donna and Ryan. They were called and returned to the hospital at 3:30am to spend some time with Ryan.

Autopsy examination

A post-mortem examination was conducted on Ryan's body by Dr Nigel Buxton, an experienced forensic pathologist, on the morning of 27 September 2007. Dr Buxton formed an initial view that the cause of death was a small intestinal volvulus (a twisting of the intestine resulting in a bowel obstruction) which triggered an increase in potassium levels leading to death. He did not section that part of the bowel where the intestinal volvulus was identified explaining to HQCC investigators that the deterioration of the bowel after death meant this would not be instructive. He acknowledged histology of the bowel would have been prudent given his findings.

At the time of his initial findings, which were included in an autopsy certificate, Dr Buxton did not have access to Ryan's blood culture results. He met with Ryan's family to discuss his findings and told them Ryan had a twisted bowel. When told Ryan's pain had been intermittent he indicated to them the volvulus itself could have been intermittent – twisting and untwisting as he said, is known to occur. Dr Buxton indicated in hindsight he might have issued an autopsy notice to the Coroner rather than the autopsy certificate, given he did not consider even at that stage that he could be sure this was the final cause of death and he had not yet received histology or toxicology results.

When Dr Buxton received the blood culture results on 3 October 2007 he noted the fast growing Group A Streptococcal bacteria which had formed.

Nonetheless, at the time of his draft autopsy report he made a finding consistent with the autopsy certificate he had issued earlier taking the view the bowel obstruction had led to septicaemia.

Uncomfortable with his findings in the draft report Dr Buxton conducted subsequent research and on 23 November 2007 submitted his final autopsy report concluding the cause of death was "*Group A Streptococcal Toxic Shock Syndrome*". He stated:

> *This is a difficult case. At time of autopsy a small intestinal volvulus was identified but this was not demonstrated in life by radiology. This may be an agonal event – and this would explain why the classic changes of intestinal infarction were not seen.*
>
> *A blood culture in life has grown a Group A Streptococcus: this is a significant finding in a child of Ryan's age. Whilst classic findings of pharyngitis were not present, there was a severe bronchopneumonia. Cervical and abdominal lymphadenopathy was identified – this is in keeping with sepsis.*
>
> *Toxic shock is associated with severe generalised pain/tenderness and can mimic peritonitis or other abdominal catastrophe. Biochemically, Ryan supports this diagnosis. The lymphadenopathy, hepatic and myocardial microscopic changes are also in accord with this diagnosis."*

Section 45 findings

I am required to find, as far as is possible, who the deceased person was, how he died, when and where he died and what caused his death. As a result of considering all of the material contained in the exhibits and the evidence given by the witnesses, the material parts of which I have summarised above, I am able to make the following findings.

The identity of the deceased: The deceased child was Ryan Charles Saunders.

How he died: Ryan died from toxic shock after those treating him failed to detect and respond to the infection in a sufficiently timely manner.

Where the person died: Ryan died in the Rockhampton Base Hospital in Queensland.

When the person died: He died on 26 September 2007.

The cause of death: The medical cause of Ryan's death was toxic shock syndrome due to group A

Streptococcal infection which probably originated in his throat.

Adequacy of care at Rockhampton Hospital

For the reasons I have detailed in this report, I am satisfied Ryan received adequate and appropriate care from his general practitioner on 20 September 2007 and at the Emerald Hospital when he was taken there by ambulance in the early hours of the morning four days later.

I will now consider the standard of care he received when he was transferred to the RBH later the same day.

I readily accept the progression of Ryan's condition from mild infection to life ending septic shock was rare and unusual. I also accept the symptoms of his developing illness were atypical, making diagnosis by clinical signs and observations difficult.

I accept the evidence the paediatric ward was very busy and full beyond planned capacity during the time Ryan was a patient there and that Dr Roper had just returned from leave. As the director of the unit he had numerous administrative demands upon his time in addition to a full clinical caseload.

I have no reason to doubt Dr Roper has given years of committed service to the people of Rockhampton and surrounding district, often struggling with inadequate resources and limited support.

I was impressed by the dedication and conscientious attitude displayed by the three junior doctors who were involved in Ryan's care.

It was apparent during the inquest that all of the doctors and nurses who cared for Ryan when he was in the RBH were profoundly distressed by his death; some have reflected deeply on whether they could have done more and whether a different outcome would have resulted had they done so.

Dr Wakefield publicly apologised to Ryan's family on behalf of Queensland Health for their terrible loss. No fair mined person could doubt his sincerity.

However, the distress of the nurses and doctors pales into insignificance when compared with the anguish of Ryan's parents. They watched their son writhe in agony, arching his back, flexing his neck, arms and legs and flinching when touched. They listened to him cry and moan in misery while their pleas for stronger pain relief were denied. They stood by helplessly as he grew weaker and slid beyond the point of complaint. His mother watched the futile attempts to resuscitate him as he died and his father, driving towards Brisbane to be there when Ryan arrived, had to retrace his steps to hold his lifeless body. Ryan's death has had a lasting impact upon the family: he is still missed terribly. It is against this background that the adequacy of his care must be judged, being mindful always of not allowing knowledge of what transpired to influence the assessment of what was done before the end result was foreseen.

Incomplete history

Chronologically the first issue to be considered when assessing the adequacy of the care give to Ryan in the RBH is whether Dr Roper made adequate inquiries on which to base his assessment of the child's condition. In particular, whether he should have reviewed the chart to make himself familiar with earlier observations and the analgesia the boy had been given at Emerald and in the Rockhampton ED.

Dr Roper said he was not aware Ryan had recorded a temperature of 38.7º on arrival at Rockhampton. He was also not aware Ryan had been given morphine at Emerald earlier in the afternoon, nor that he had been given 50mcg of Fentanyl in the Rockhampton ED less than two hours prior to Dr Roper reviewing him. This information was contained in the Emerald Hospital file that came with Ryan and the notes made in the chart in the Rockhampton ED.

These factors are significant because Dr Roper said in evidence his assessment that Ryan was afebrile and only irritable, rather than in pain, contributed to his dismissing abdominal pathology as the cause of Ryan's illness.

Dr Roper received a summary of Ryan's clinical presentation and history from Dr Roos. It is submitted on his behalf he had no basis to suspect analgesia had been given to Ryan and he was entitled to rely on the referral letter to disclose all relevant historical information. I accept he was entitled to rely on the information in the referral but a careful practitioner would have inquired into such a significant issue in my view. For example, had he asked Dr Roos what pain relief Ryan had received in all likelihood she would have looked at the chart and given him accurate information. The most obvious conclusion is Dr Roper simply overlooked the issue.

I am not persuaded it is appropriate to devise a pain relief regime without considering what analgesia the patient has already been given. Nor do I accept the failure of the night nurses to seek a medical review or increased medication necessarily indicates the plan was successful: for example the note describing Ryan over that night included, "*Extremely irritable all night, not tolerating contact with staff. Arched posturing at start of shift…"* which would suggest pain management was not optimal. His parent's account of Ryan's pain during that night put it beyond doubt. I consider this a shortcoming in Ryan's care.

No septic work up or antibiotics

After his admission at about 5.00pm on 24 September Ryan was examined by Dr Roos, reviewed by Dr Roper and a lumbar puncture was performed. This enabled meningitis to be excluded but did not enable the cause of Ryan's illness to be diagnosed and gave no information concerning the possibility of an infective process occurring in other parts of Ryan's body. Nothing else was done to try and diagnose Ryan's illness until he was seen at the ward round the next morning at 9.15 am. This raises the question of whether more should

have been done on the evening of the admission: in particular, whether a septic work up should have been done and/or empirical antibiotics given. The blood analysis would have involved the growing of a blood culture and testing of C-reactive protein (CRP) levels that would have indicated whether Ryan was suffering from an infection and whether it was viral or bacterial in origin. Had antibiotics been given at this stage they may have saved Ryan's life by combating the Streptococcal infection the autopsy confirmed was the fatal agent.

There was a significant body of expert evidence led at the inquest indicating that whenever a lumbar puncture is undertaken these other steps should always be considered and usually undertaken.

Dr Gavin Wheaton is the Medical Director of the Division of Paediatric Medicine at the Adelaide Women and Children's Hospital. He has extensive experience in large and smaller hospitals. He stated in his report dated 9 April 2009:

> *In a child with possible meningitis who is sick enough to warrant a lumbar puncture, several tests would usually be performed to exclude other possible sites of infection. This is known as a septic work-up and would usually include a blood count, blood culture, urine specimen and possibly a chest x-ray. C-reactive protein, which is a marker of infection or inflammation, may also be included.*

Dr Wheaton went on to say:

> *In my opinion these tests should have been performed. A blood count had been performed earlier in the day and the collection of a urine specimen was requested. Although it can not be assumed that blood cultures would have been positive within a certain time-frame, the failure to perform a blood culture at this point was a significant omission.*

At the inquest Dr Wheaton confirmed that in his view a failure to undertake these tests in Ryan's case amounted to a "*significant omission*".

Dr Marion Woods, a senior staff specialist in infectious diseases at the Royal Brisbane and Women's Hospital, confirmed that such a process forms part of the training given to practitioners at the RBWH. He responded to a question as to whether he would still follow this practice even if the patient did not have a septic appearance by saying:

> *If someone rang me and said from - from Emerald or from Rocky and said, "I've got patient with meningitis. On clinical grounds I'm going to do a lumbar puncture. Should I give him antibiotics before I do it?" And, what I would say is my - as my reflex action I would say get a set of blood cultures, give a dose of antibiotics and then take your time doing your lumbar puncture. I mean, that's - that's what I would - that's what I would advise.*

Dr Jeffrey Prebble, an experienced consultant paediatrician from Toowoomba, said sepsis needed to be considered in Ryan's case and once the lumbar puncture had ruled out meningitis, further steps needed to be taken. He agreed a septic screen was a common practice in such cases – indeed it was unusual not to do one and the treating team would have needed a good reason not to. He said there was no down-side to doing a toxic work up in Ryan's case other than the discomfort caused by inserting a cannula to take blood. Dr Prebble added that in his hospital the junior doctors would have started the process for such a work up before he even saw the patient.

The three experts also agreed practice varied depending upon the circumstances of the case with some hospitals having trigger points such as particular temperatures or a combination of symptoms.

Dr Roper explained he had a very different approach when deciding whether to instigate a septic work up and/or empirical antibiotics. He said he considered it was only necessary if the patient had any of the following symptoms that could not be explained, namely, a temperature over 39º; a septic appearance; a high white cell count; or a high CRP. He said as Ryan did not have any of these he was inclined to consider his condition was viral in origin.

Of course his reasoning was somewhat circular in that it denied him a CRP reading likely to have led to the opposite conclusion. Equally, it would be unfair to criticise him for not seeking a CRP level if none of the symptoms were present and there was no other basis to suggest a toxic work up should have been done. In this case another basis to seek the work up could have been an unwell child, with symptoms suggesting meningitis, which had been negated by a lumbar puncture but who was exhibiting flexion of the neck, arms and legs, had been sick for four days and had previously been running a fever and in sufficient pain to require morphine – all factors which were known, or should have been known by Dr Roper. In those circumstances further investigation by way of a toxic work up was called for.

Dr Roper agreed at the inquest the only detriment to ordering a blood culture and CRP screening was the discomfort collecting the necessary blood might cause Ryan. In his HQCC interview he cited the perceived but unspoken reluctance of Ryan's parents for Ryan to undergo any further tests as one reason why he did not proceed with the blood test. It was submitted on his behalf that the interviewer led this response and Dr Roper's position was he did not take blood for testing because he did not believe it was necessary. I accept that throughout the investigation and inquest Dr Roper contended blood tests were not necessary but it is equally clear he relied on his perception of the parents' attitude as further justification for not taking blood. At the inquest the following interchange occurred:

> Counsel Assisting: *Is the view of a parent on whether blood tests should or shouldn't be done something that you normally place weight on in deciding whether to take a blood test?*

Dr Roper: *No*.

Counsel Assisting: *Why was it that you did it here?*

Dr Roper: *That was only part of my reason for not doing the blood culture.*

Counsel Assisting: *But you placed some weight on it, at least?*

Dr Roper: *As part of my reasoning. Yes.*

Counsel Assisting: *Okay. I'm interested if it's not something you usually do why you did it here. Why you placed any weight at all on their views?*

Dr Roper: *I can't explain it.*

I am of the view Dr Roper had no basis on which to conclude Ryan's parents had any such reluctance. If he believed they had, he should have discussed it with them. I consider this an attempt on his part to bolster what was otherwise an inadequate explanation for his failure to undertake these tests.

At 9.15am Dr Roper again rejected the suggestion of the junior doctors who participated in the ward round to do blood screening. He relied on the same justification as when explaining his decision not to take these steps the night before. When a CRP test was finally done it demonstrated a highly infective process was underway but by that stage Ryan could not be saved. The evidence indicates had the same test been done the night before or immediately after the ward round the outcome may have been different.

I readily accept the expert opinions that a Streptococcal A infection of such seriousness as to lead to toxic shock is extremely rare and in this case the symptoms were atypcial and unlikely to be diagnosed by clinical signs.

However, the weight of the expert opinion is the blood work up should have been done sooner and it was unusual and unnecessary for it not to have been done. The experts were less clear on whether antibiotics should have been given as a precautionary measure before the presence of a bacterial infection had been established.

The lumbar puncture excluded meningitis at about 9.00pm on the night of Ryan's admission. The level of creatine kinase excluded viral myositis soon after 11.00am the next morning. X-rays, ultrasound and CT scans done in the early afternoon were inconclusive. Finally, at about 3.30pm a blood test revealed a CRP level that could only be explained by a bacterial infection but by then it was too late to combat it.

There was no reason why these tests could not have been done far sooner and in my view, absent a firm diagnosis of Ryan's illness, they should have

been. There was no valid reason the various differential diagnoses needed to be eliminated sequentially. In my view, despite urging from a number of junior doctors to order such tests, Dr Roper repeatedly made a serious error of judgment when he declined to do so.

Pain management

Dr Roos had prescribed Panadol and Nurofen for Ryan's pain when she had examined him on the evening of 24 September. It was given to him regularly throughout the night.

However, from the outset, Ryan's parents have been distressed by what they believe was inadequate pain management. Indeed they were of the opinion it was the severe pain causing Ryan to tense and stiffen when touched that Dr Roos and Dr Roper had misdiagnosed as signs of meningitis.

The HQCC report quotes from police interviews with Ryan's parents describing what from their perspective occurred after the lumbar puncture results had been returned. Sections of that are reproduced above. It is noted they describe Ryan being in excruciating pain and crying in agony for much of the night. They could not understand why when he had earlier been given morphine at the Emerald Hospital he was then left with only Panadol and Nurofen. They said:

> *The whole ward could hear him screaming and no one cared. To see a child still in that much pain - surely that should have rung some kind of alarm bells, especially for paediatric medical staff…*

When the treating team examined him at the ward round at 9.15am, it was obvious to them he was in considerable pain, prompting Dr Kamal to suggest he be given morphine. She recalls him crying during the examination and Dr Higgins noted "*child c/o* (complaining of) *pain all over*.

Dr Roper rejected this suggestion on the basis morphine could make localising the pain, and thus diagnosis of its cause, more difficult. As detailed above, at 11.30am he relented to the extent he authorised the administering of codeine before finally agreeing to a dose of morphine being administered shortly after 3.00pm. An hour or so later Dr Kamal wrote an order for PRN morphine.

The evidence from the nurses and Ryan's parents establishes he was in severe pain throughout the evening of 24 September the following day. One nurse describes hearing him wailing before she even entered the ward. It was submitted on behalf of Dr Roper this witness was unreliable. However Ryan's father gave a similar account of hearing his son wailing when he came to the hospital in the morning. Further, at the inquest Dr Roper acknowledged Ryan was evidently in sufficient pain to warrant the administration of morphine had he not been concerned the opiate may have masked symptoms helpful to diagnosis.

Conversely, Dr Roper denies hearing or seeing Ryan crying at any time. I suspect both Dr Roper and the nurse in question are exaggerating. In any event, I consider the manner in which Ryan's pain was managed warrants consideration.

The evidence from Dr Prebble and Dr Wheaton establishes the approach taken by Dr Roper is recognised as legitimate and certainly not improper, although perhaps a little "old fashioned". Dr Wheaton wrote in his report:

> *My understanding of current practice is that analgesia should be given according to need, regardless of problems with establishing the diagnosis. The need for narcotic analgesia is also a marker of severity of symptoms and should have prompted consultant review.*

In evidence he said, "*If pain is bad enough to warrant morphine, it should be given."*

The approach adopted by Dr Roper in this case requires the practitioner to attempt to find a reasonable balance between the likely diagnostic benefits of withholding the analgesia and the degree of pain suffered by the child. I am concerned as to whether that balance was reasonably struck in this case. I am convinced Ryan was in severe pain for most of his time in the RBH before morphine was given. To justify withholding pain relief from such a young child in those circumstances would in my view require a high degree of confidence the ongoing pain would likely assist in the diagnosis of its cause.

Stronger analgesia could have been given to Ryan after the lumbar puncture and withheld for sufficient time prior to the ward round so it didn't compromise the examination of the patient then.

By 9.15am on 25 September, Ryan had been unable to communicate the location of his pain for over 30 hours; clinical examinations had been conducted by numerous doctors without success. Dr Roper then ordered diagnostic imaging and blood analysis to investigate the differential diagnoses, none of which would have been compromised by adequate pain relief. I don't accept the likely benefits of withholding pain relief justified the suffering it caused. Reservation against accepting Dr Roper's justification is heightened by his claim part of the reason he refrained from taking blood for testing the evening before was to avoid the discomfort doing so would cause. That seems inconsistent with then leaving the child with minimal pain relief overnight when no investigations of his illness were planned or undertaken.

The inadequacy of the management of Ryan's pain could not be attributed to the nursing staff. I accept they made repeated requests for stronger analgesia which were denied by the medical staff. Based on the expert evidence I have heard, I consider this an error of judgement on Dr Roper's part.

Failure to examine

Dr Wheaton made the following statement in his report and repeated the proposition at the inquest:

> *There was no consultant review between the ward round at 0900 and surgical review at 1850. Dr Roper and then Dr Mercer kept abreast of developments but did not physically review the patient. Consultant review could reasonably have been expected, particularly once the very abnormal blood test results became available, and after escalation of pain relief to morphine*.

Conversely, Dr Prebble suggested consultants are entitled to expect junior doctors to carry out such roles adequately and to rely on their assessments.

It seems Dr Roper relied on Dr Kamal and Dr Higgins to implement the treatment plan formulated after Ryan's CRP result became known.

Nonetheless I accept Dr Wheaton's view that consultant review would be expected after the escalation of pain relief to morphine. At that time Dr Kamal and Dr Higgins were absent from the paediatric ward. The failure of Dr Roper to review Ryan in these circumstances is surprising but it is clear it had no impact on the outcome.

Referral pursuant to s48

Section 48(4) of the Coroners Act authorises a coroner who reasonably believes information gathered while investigating a death might cause a professional disciplinary body to inquire into the conduct of a relevant professional to give the information to that body.

As from 1 July 2010 the Medical Board of Australia is the body appointed to consider complaints and notifications about the conduct of medical practitioners in Queensland.

The *Health Practitioner National Law Act 2009* (Qld) sets out the grounds on which voluntary notification can be made to the Board in section 144. So far as may be relevant to this case that section provides:

> *(1) A voluntary notification about a registered health practitioner may be made to the National Agency on any of the following grounds—*
>
> *(a) that the practitioner's professional conduct is, or may be, of a lesser standard than that which might reasonably be expected of the practitioner by the public or the practitioner's professional peers;*
>
> *(b) that the knowledge, skill or judgment possessed, or care exercised by, the practitioner in the practice of the practitioner's health profession is, or may be, below the standard reasonably expected;*

The Act confers powers on the Board to investigate and commence disciplinary proceedings as a result of a notification. In my view those provisions would normally require me to consider whether the medical care given to Ryan was of an appropriate standard and if not, whether it was such

that it should be referred to the Medical Board of Australia for consideration of disciplinary action.

However, I am aware the HQCC has previously lodged a complaint regarding three aspects of the conduct of Dr Roper with the then Medical Board of Queensland. Investigation of that complaint was ultimately completed by the Medical Board of Australia as a result of the state board being subsumed into that national authority.

The complaint from the HQCC alleged unsatisfactory professional conduct constituted by:

i) The failure to review Ryan after Dr Roper became aware of his abnormal blood results;
ii) The failure to communicate adequately with Ryan's parents; and
iii) The failure to conduct a personal handover of Ryan's case to Dr Mercer.

On 24 September 2010 the Board decided there were no grounds for disciplinary action against Dr Roper on the bases Dr Roper could not be expected to review all medical services for patients under his care and was entitled to rely on junior doctors whom he understood to be competent; the ratio of resources to patients at Rockhampton during Ryan's stay meant communication with Ryan's parents was not ideal but was adequate when considering the need to prioritise those resources and the allocation of staff; and the Board did not accept there was an inadequacy in the process of handover notwithstanding it had not occurred face to face between consultants.

Professional disciplinary action is not punitive in focus: it is intended to correct and prevent aberrant behaviour rather than punish. As a result of participating in the HQCC investigation, this inquest and the searching self reflection any insightful practitioner would undertake after being involved in such a tragic case, I have no doubt all of the practitioners involved in Ryan's care would act very differently if they were confronted with a similar case in future. That expectation, coupled with the systemic changes introduced as a result of the HQCC investigation, leads me to conclude no good purpose would be served by referring the conduct of Dr Roper for further consideration by the Board.

Comments and preventive recommendations

Section 46, in so far as it is relevant to this matter, provides that a coroner may comment on anything connected with a death that relates to public health or safety, the administration of justice or ways to prevent deaths from happening in similar circumstances in the future.

When considering what improvements might be recommended as a result of the events leading to Ryan's death I have benefited from having regard to the 15 recommendations made by the HQCC. They are set out in full at the end of these findings. Although most of them would not have resulted in a different

outcome for Ryan, I am satisfied each of them is an appropriate response to the problematic systemic issues brought into focus by Ryan's case.

At the inquest Dr John Wakefield explained how Queensland Health has responded to the HQCC recommendations. Dr Wakefield is the executive director of the Queensland Health Patient Safety and Quality Improvement Service. He was responsible for overseeing the implementation of the HQCC recommendations.

He told the inquest that 12 of the 15 recommendations had been implemented in full. Dr Wakefield gave evidence in relation to the remaining three recommendations which made it clear they are very close to finalisation. Those recommendations are numbers 3, 7 and 8. In the case of recommendations 3 and 8 delays have understandably been caused by the cost and complexity of putting in place new information technology platforms and associated work practices. These are near completion and will seemingly result in best practice when it comes to the way in which doctors in Queensland hospitals order pathology tests and how they are notified of critical pathology results.

Recommendation 7 could in fact be said to have been fulfilled as the HQCC recommended that Queensland Health consider developing an early warning system for use in all its paediatric facilities and the department has in fact developed such a system and has trialled it in a number of hospitals, including Rockhampton.

The Children's Early Warning Tool (CEWT) is a package of age specific colour coded observations charts that allows an overall illness-severity score to be calculated and prompts a response appropriate to that score.

It presents all vital sign readings in a graphical form that allows easy recognition of trends which assists clinicians and nurses to readily identify when a patient is deteriorating. It stipulates specific actions when certain trigger points are reached – these may be either a dangerously high/low level of one vital sign or a cumulative, combination of a number.

Dr Wakefield explained the research that has gone into this task has been aimed at making it sufficiently user friendly that its uptake has been voluntary rather than imposed. That research involved extensive analysis of retrospective, and then prospective, case studies. The research allowed the levels at which further action is prompted to be set at levels so that such action is rare enough that staff do not become jaded with prompts from the system, but common enough such that it is effective in a non-intensive care situation.

Dr Higgins spoke positively of her experience using CEWT in a practical setting at the Royal Children's Hospital in Brisbane where it is being trialled.

I am satisfied the research and effort put into the development of the CEWT system is a satisfactory response to the HQCC recommendation and appears,

on the material put before the inquest, to be a significant and noteworthy advance in paediatric care. I commend all involved in its development.

I am satisfied the HQCC recommendations have addressed all systemic matters arising from the events leading to Ryan's death. I do not consider I can usefully add to that with any further recommendations.

I close this inquest.

Michael Barnes
State Coroner
Brisbane
07 October 2011

ANNEXURE 1: HQCC RECOMMENDATIONS

Recommendation 1
Orientation of Queensland Emergency Medical System Coordination Centre clinical retrieval staff to include adequate training about the service capability levels of all hospital throughout Queensland. Immediate online access to this information is to be available at all times.

Current Position
This recommendation has been fully implemented with Queensland Health having put in place orientation and induction packages for all staff and a detailed intranet site addressing these issues having commenced in February 2010. External websites ensure that the relevant information is widely accessible

Recommendation 2
Queensland Health to review existing policies and processes to ensure that appropriate access to tertiary level telemedical advice is provided to rural and regional medical officers and Queensland Emergency Medical System Coordination Centre retrieval and transfer coordinators.

Current Position
This recommendation has been fully addressed with a central 24/7 telephone number in place that links medical and ambulance staff throughout Queensland to tertiary level specialists. Further to this 107 rural, regional or remote Queensland Health resuscitation rooms have videoconferencing links to the Royal Children's Hospital. A system is in place to ensure all retrieval service members are trained in its use.

Recommendation 3
Queensland Health to advise when the forced CRP (C-reactive protein) reporting tool has been implemented state-wide.

Current Position
It is expected that the implementation of the information technology platform required to fully implement this recommendation will be done in 2013. It is acknowledged that significant progress has been made with 16 of 17 health service districts having the AUSCARE pathology support program in place by December 2010 (a pre-requisite to final implementation).

Recommendation 4
Queensland Health to review the accessibility of educative tools and clinical guidelines on its Clinical Knowledge Network (CKN) and ensure that all clinical staff are informed of the importance of CKN to their clinical practice.

Current Position
This recommendation was implemented through the purchase of a specialty computer program and the conduct of extensive consultation and training through 2009 and early 2010. A report was prepared in May 2010 setting out the steps taken in response to the recommendation and the HQCC have confirmed the adequacy of the response by Queensland Health

Recommendation 5
Queensland Health to develop, implement and educate staff about a formal on-call process to ensure radiological imaging is available at Rockhampton Hospital 24 hours per day, with consideration to be given for state-wide expansion of the process.

Current Position
Rockhampton Hospital has 24 hour availability of radiological imaging and in May 2010 the regular on-site presence of a radiologist was significantly increased. State-wide implementation has required a significant focus on recruitment and improvement in facilities available for diagnostic imaging. Public tenders resulted in contracts with private companies to increase the availability of diagnostic imaging services in several health districts. As at August this year 124 of 130 medical imaging facilities in Queensland have access to electronic access to radiology images and reports. The remaining six will have that capability by Jun 2012. In April 2011 the HQCC stated it was satisfied that this recommendation had been satisfactorily addressed.

Recommendation 6
Queensland Health to implement, monitor and report to HQCC its formal process to ensure handover occurs between shifts at the senior medical officer and consultant level at Rockhampton Hospital.

Current Position
The HQCC have stated that they are satisfied with the progress made in response to this recommendation by Rockhampton Hospital. A more formal, documented handover between clinicians occurs daily at 8am and procedures now require a direct verbal handover between consultants each afternoon.

Recommendation 7
Queensland Health to consider developing and implementing an early warning observation system for use in all Queensland Health paediatric facilities and by the Paediatric Emergency Team.

Current Position
This recommendation has been addressed to the extent that such a system has been considered. The actual implementation of the childhood early warning test (CEWT) is discussed in detail in the body of these findings.

Recommendation 8
Queensland Health to implement an escalation procedure for pathology reports and consider the merits automated pathology alert system which automatically signals and notifies the relevant clinician of any significant variance in results.

Current Position
The AUSCARE pathology system referred to earlier has been implemented in all public hospitals and health care centres run by Queensland Health in 16 of the 17 health service districts. This includes training in the use of that system for all members of staff. That system puts in place a system of notification that addresses the matters raised in the recommendation. The one remaining health care district will have AUSCARE in place by April 2012.

Recommendation 9
Queensland Health to review nursing practices and processes that may have been impacted on the nursing care provided at Rockhampton Hospital (particularly noting pain management, fluid balance, regularity and types of observations).

Current Position
Queensland Health commissioned an external review of nursing care at Rockhampton Hospital and the report arising from that investigation was received in March 2010. Each recommendation of the report was implemented by June 2011. This included training to develop skills in assertiveness and the advocating of patient safety

Recommendation 10
Queensland Health to undertake a review of communication within the healthcare team in the Paediatrics Unit at Rockhampton Hospital and report all recommendations and action plans for improvement to the HQCC.

Current Position
This review has been conducted and changes to procedure and policy have resulted. New protocols set have put in place a more formal handover process between shifts. The Rockhampton Hospital was chosen as a pilot site for a new team-work focussed training program that has subsequently been rolled out elsewhere. Audits and confidential surveys have been used to monitor improvements in areas such as patient handover; communication between staff and appropriate escalation of clinical management issues.

Recommendation 11
Medical Board of Queensland to consider whether any further investigations are required into the management and supervision of Ryan Saunders by Director of Paediatrics, Rockhampton Hospital, Dr Peter Roper.

Current position
The Medical board declined to take any action.

Recommendation 12
Queensland Health to implement and evaluate Recommendation 1, 3 and 4 of the Root Cause Analysis (RCA).

Current Position
These three recommendations include sub-categories such that they, in effect, set out six areas to be addressed:

i) All paediatric staff at Rockhampton Hospital to undertake Paediatric Life Support (PLS) Training;
ii) Review rostering practices within Rockhampton Hospital ICU and Paediatric Unit to enable acutely unwell children to be managed in ICU without compromising the function of the paediatric ward;
iii) Provide regular education on septic shock including Toxic Shock Syndrome to all clinical staff who manage the care of children;
iv) The Royal Children's Hospital to conduct a Grand Round education session on septic shock including Toxic Shock Syndrome, allowing access to Queensland Health hospitals state-wide;
v) Conduct and publish an audit of septic shock in children including Toxic Shock Syndrome in Queensland, in conjunction with the Tropical Public Health department;
vi) Include clinical information on septic shock in all new paediatric staff orientation manuals.

The inquest received evidence establishing that all of these recommendations have been implemented.

Recommendation 13
Queensland Emergency Medical System Coordination Centre to review and improve its sentinel event review processes and to provide adequate training to staff performing sentinel reviews.

Current Position
The inquest received a statement from Dr Mark Elcock, State Medical Director, Retrieval Services Queensland (RSQ) addressing the steps taken in response to this recommendation. Commencing in early 2010, RSQ conducted a comprehensive examination of the sentinel event (now called Reportable Event) review process. Changes have been made to that process and the way it interacts with other QH review standards. RSQ staff undertake

patient safety and RCA training on an ongoing basis. The HQCC have agreed that his recommendation has now been addressed.

Recommendation 14
Queensland Health Forensic and Scientific Services, in consultation with the Office of the State Coroner, to review current mortuary practices and develop state-wide guidelines for the recording, storage and retention of autopsy information.

Recommendation 15
Forensic pathologists contracted to perform autopsy examinations within Queensland Health facilities to be provided with system access to both forensic and clinical modules within the Auslab pathology information system.

Current Position
The inquest received statements from Dr Charles Naylor, Senior Director, Forensic and Scientific Services, addressing recommendations 14 and 15. Dr Naylor wrote and promulgated standard operating procedures for the compilation and storage of coronial autopsy records. That seeks to ensure adherence to standards published by the National Association of Testing Authorities (NATA) although Dr Naylor makes the point that these were being followed (in this case and others at the time) in any event.

Dr Naylor confirmed that Auslab pathology information is available to all Forensic pathologists in Queensland and this has been the case since 2009.

Recommendation 16
Queensland Health to establish formalised quality improvement processes within the Rockhampton Hospital Paediatric Unit, including a multidisciplinary Mortality and Morbidity Committee with terms of reference to include a requirement that meetings be held on a six monthly basis.

Current Position
This Committee has been established and meetings are conducted every six months. A range of other quality improvement processes relating to this recommendation were outlined at the inquest. It has been implemented to the satisfaction of the HQCC