NEW SOUTH WALES STATE CORONER

Name of Deceased:	**Jacob Belim**
File Number:	**0839/09**
Hearing Dates:	**25 – 29 July 2011 and 1 August 2011**
Location of Inquest:	**NSW State Coroner's Court, Glebe**
Date of Finding:	**15 August 2011**
Coroner:	**Magistrate Scott Mitchell, Deputy State Coroner**

Representations:

- **Ms. K. Stern instructed by Ms. J. Kavanagh of the *Crown Solicitor's Office* appeared to assist the Coroner**
- **Mr. D. Graham of Counsel for Jacob's family**
- **Mr. Pike of Counsel for Dr. Khan**
- **Mr. M. Fordham of Counsel for *Sydney South West Local Health District, Sydney Children's Hospital Network* and the *Health Administration Corporation***
- **Ms. Rudland of Counsel for Registered Nurse Todd, Registered Nurse Webster and Registered Nurse Idquival.**

FINDINGS

1. Jacob Leonel Belim was born on 7 June, 2000. He was the son of Emanuel and Yvonne Belim of Busby, NSW where he lived with his parents and younger brother, Adrian and his twin younger sisters. Jacob died of septic shock consequent on ruptured appendix leading to extensive peritonitis at the *Royal Alexandra Hospital for Children* at Westmead at 0228 on 28 March, 2009. He was eight years of age.

The Inquest

2. This is an inquest into his death. Ms. K. Stern instructed by Ms. J. Kavanagh of the *Crown Solicitor's Office* appeared to assist the Coroner and the other appearances were Mr. D. Graham of Counsel for Jacob's family, Mr. E. Pike of Counsel for Dr. Khan, Mr. M. Fordham of Counsel for *Sydney South West Local Health District, Sydney Children's Hospital Network* and the *Health Administration Corporation* and Ms. Rudland of Counsel for Registered Nurse Todd, Registered Nurse Webster and Registered Nurse Idquival.

   Detective Senior Constable Ben Waldron is the *Officer in Charge* of the investigation.

3. The *formal documents* including the *P79A Report*, the *Form A Report of Death of a Patient,* the *Report of Death Associated with Anaesthesia/Sedation,* the *Identification Statement* and the *Autopsy Report* are **EXHIBIT 1.** The Coronial Brief is **EXHIBIT 2.**

4. Those who appeared at the inquest to give evidence were:-
   - The *Officer in Charge*, Detective Senior Constable Ben Waldron;
   - Ambulance Officer James Clark;
   - Registered Nurse Stephanie Webster;
   - Jacob's *GP*, Dr. Chandra Gounder;
   - Registered Nurse Florintina Idquival;
   - Dr. Bhaveshkumar Patel, Surgical Registrar at Westmead;

- RN Diane Todd, Registered Nurse at Liverpool;
- Dr. Claire Ferreira, Emergency Registrar at Liverpool;
- Dr. Sam Nasser, Paediatric Registrar at Liverpool;
- Dr. SVS Soundappan, Paediatric Surgeon at Westmead;
- Dr. Susan Hale, Anaesthetist at Westmead;
- Dr. Kunal Thacker, Subspecialties Registrar at Westmead;
- Dr. Richard Charles Cracknell, Diorector of Emergency Services at Liverpool; and
- Associate Professor John Raftos.

Jacob

5. Mr and Mrs. Belim attended the hearing throughout and Mrs. Belim told the inquest that her son was *"gentle, kind, honest and funny"* with *"the best smile."* According to his mother, Jacob enjoyed school and enjoyed his sports, especially handball, and, his mother said, *"he did not need to come first."* He understood, rather, that the important things were *"to have fun and to be fair."* Mrs. Belim told us that Jacob's best friend was his brother.

6. Mr. and Mrs. Belim allowed us to play a video recording entitled *"Jacob's Journey"* which provided the inquest with a panorama of his life replete, it seemed to me, with fun and affection. Clearly, Jacob was dearly loved and brought the greatest joy to his parents, his family and those lucky enough to have known him.

Dr. Khan

7. On 23 March, 2009, Jacob who had no medical history complained of abdominal pain and vomiting. His mother took him to *First Care Medical Centre,* Busby next day and saw Dr. Hamid Khan – not his regular *GP*, who examined him and prescribed an elixir to settle the pain. It is not clear how close and thorough was Dr. Khan's examination but he entirely missed Jacob's appendicitis. Two experts, Dr Raftos and Dr. Cox, an experienced General Practitioner and a Fellow of the *Royal Australian College of General Practitioners,* provided evidence as to the standard to care properly expected of a *GP* such as Dr. Khan.

8. They came to substantially different conclusions and, in the circumstances of this case, particularly where I have had no opportunity to hear from Dr. Khan himself, I think it is unnecessary to spend time resolving those differences. It seems to me, however, that his evidence that he requested "*Jacob's Dad"* to bring him back next day, whereas it was actually Mrs. Belin to whom he spoke, invites one to wonder how much thought and attention Dr. Khan gave to the matter. Dr. Khan could not appear at the inquest and, instead, I have a medical certificate indicating his incapacity to appear on medical grounds.

Dr. Gounder

9. Next day, 25 March, Jacob was still experiencing stomach pain which a suppository did nothing to alleviate and, early next morning, 26 March, Mrs. Belim took him back to the medical centre to see Dr. Chandra Gounder at *First Care Medical Centre.* Dr. Gounder was his regular doctor and she examined him. On examination, Dr. Gounder noted, Jacob's temperature was 37.8 and pulse was100 bpm. She noted that his abdomen was distended and tender and bowel sounds were absent. His tongue was dry. She described the *"board-like rigidity"* of his abdomen as a *"tell tale sign"* of acute peritonitis. Mrs. Belim explained that the lad had been in significant pain. Dr. Gounder wrote *"? Obstruction ? ruptured appendix."* His cardiovascular and respiratory systems were normal. Both his mother and Dr. Gounder noted that Jacob was having difficulty walking, another significant sign. Dr. Gounder diagnosed appendicitis and she thought the appendix may have ruptured and she knew Jacob needed urgent surgery. She phoned an ambulance to take Jacob to hospital and wrote a referral letter a copy of which is annexed to her statement contained in the Coronial Brief. That letter described Jacob's *"distended, tender, rigid"* abdomen and diagnosed *"? Appendicitis."* The letter does not mention *"rupture"* or *"perforation"* but Dr. Gounder says she mentioned *"appendicitis"* which, she thought, *"should have been enough."*

10. About three hours after Jacob left her surgery, Dr. Gounder phoned Liverpool Hospital and, when she could not speak to a doctor, told *"the nurse in the Emergency Department in the Paediatric Section"* that *"this boy looks like having*

ruptured appendix. Please investigate." It appears that this message failed to draw anybody's attention to Dr. Gounder's correct diagnosis.

The Ambulance

11. The ambulance, which arrived at *First Care Medical Centre* promptly, took Jacob and his mother to Liverpool Hospital. James Clark was the treating officer aboard that ambulance. It appears that Dr. Gounder did not specifically nominate Liverpool Hospital as the hospital to which Jacob should be taken. Rather, Liverpool Hospital, being one of the hospitals closest to the *First Care Medical Centre* and being listed in the *Matrix Sydney West Area Health Service* as capable of taking paediatric patients and not having exceeded its hourly quota of admissions, was selected by the ambulance officers from a *drop down menu* available to them on the *on-board* terminal in the ambulance. Mr. Clark's evidence is that he had never been made aware that sick children requiring surgery should not be taken to Liverpool Hospital. At the handover to the ambulance officers, Dr. Gounder provided them with her referral letter. Ambulance Service notes describe Jacob as having an elevated temperature and a normal pulse rate and his abdomen is described as distended. Mr. Clark's evidence is that, on palpation of the abdomen, Jacob experienced pain to the right lower quadrant. Jacob was suffering from diarrhoea. Because he seemed *"reasonably stable,"* Jacob was categorised as a *"non-urgent"* case but Mr. Clark, told the inquest that such a categorisation would only marginally have increased travel time.

Liverpool Hospital

12. Jacob arrived at Liverpool Hospital at about 1022 on 26 March, 2009. Ambulance officers handed over Dr. Gounder's letter of referral and provided some information to staff and Jacob was admitted. His mother says he was *"pale and looked very tired"* which, in general terms, seems to have been the impression of almost everybody who saw him that day except perhaps Dr. Nassar. His temperature on arrival was noted as 37.7, his pulse rate rhythm as 99bpm and his pulse oximetry as 98%. Registered Nurse Craig Evans' noted *"abdominal pain onset 4/7 ago. O/E PT alert, settled while resting on stretcher but does have distended abdomen that is firm to palpate and tender too. RIF*

(right iliac fossa) also tender. Low grade temp. noted. V/N (diarrhoea/vomiting) reported to ED Registrar, aware of patient's condition…"

13. When Mrs. Belim asked, shortly after Jacob's admission, when he would be going to theatre, a nurses told her to *"wait for the doctor."* but *RN* Evans says that *"given the distension of Jacob's abdomen, I thought he had an acute surgical abdomen that needed to be looked at sooner rather than later"* and, for that reason and because of Jacob's pain, Mr. Evans spoke to the *ED* Registrar pointing out that Jacob *"was triaged as category 2, which is to be seen within ten minutes."*

14. Nursing notes were taken at Liverpool Hospital at 1045 and 1120 and at 1230 and 1350 by *RN* Kate Alchin and *RN* Diane Todd. Both noted Jacob's *"quiet, pale and unwell"* affect, the distension and rigidity of his abdomen and, in particular, his *"dark brown vomit, faecal in appearance."* *RN* Todd recalls Mrs. Belim suggesting that Jacob was suffering from appendicitis but she says that *"because of the lack of temperature, the overall abdominal pain, Jacob's pain responses and, most importantly, the faecal matter"* which is a reference to his vomit, *"it looked more like a bowel obstruction."*

Dr. Ferriera

15. Jacob was seen by Dr. Claire Ferreira, the emergency department registrar, at about 1120 when a nurse, probably *RN* Evans, asked her to see him out of turn. At that stage Jacob, who at triage had been marked *"category 2",* that is *"to be seen within 10 minutes,"* had been waiting for about 80 minutes. Dr. Ferreira describes Jacob as *"pale and unwell."* She noted *"pseudobstruction/bowel obs?"* and, strangely enough, made no reference to appendix as, at least, a differential diagnosis. Her plan was for x-rays, baseline bloods, *NG* tube, *IV* fluids, *morphine* and *maxalon*. These were chartered as being prescribed at 1200 and morphine again at 1330. To these were later added *IV* fluids, started at about 1245, and *IV* antibiotics, *ampicillin* and *flagyl*, started at 1540 and 1545 on the basis of a *"Once Only Nurse Initiated Medication"* form. The delay in providing hydration and, more particularly, *IV* antibiotics is unexplained and troubling.

16. Dr. Ferreira was aware of Jacob's *"dark brown vomit, faecal in appearance"* observed by *RN* Todd which she took as an indicator that he was *"particularly unwell."* Dr. Ferreira knew that Jacob had trouble walking. She knew that his abdomen was distended and tender. She took the history of four days abdominal pain so that, as she told the inquest, she was aware that the matter was urgent and she knew that an appendectomy or some other form of abdominal surgery would inevitably be required. Furthermore, by March, 2009 although she claims to have been unaware of any policy of Liverpool Hospital regarding paediatric abdominal surgery, she says was aware that it was unlikely that Jacob would have his surgery at Liverpool and she knew that, most likely, he would have to be transferred. In summary, by 1130 she knew that it was highly likely that Jacob would need an operation and that the operation would be undertaken elsewhere.

17. By 1130 Dr. Ferreira had available to her results of tests ordered at triage. She could see that the temperature and pulse rates taken at triage could be connected with pathology. She could see that tests results such as those pointing to low sodium level, the high potassium level, low calcium level and the raised urea - all signs of electrolytic imbalance, pointed to the possibility of shock and dehydration and I cannot see how she could have failed to see that Jacob was significantly ill and that the requirement of surgery was extremely urgent. At the same time, Dr. Ferreira was aware of the C Reactive Protein which, at 380.0 mg/l, was grossly elevated - consistent with appendicitis and/or peritonitis. Further, even if she failed to read Dr. Gounder's letter of referral and was unaware of her subsequent phone call to Liverpool Hospital, Dr. Ferreira was well aware that Mrs. Belim was insistent that her son was suffering from appendicitis.

18. Dr. Ferreira told the inquest that she cannot recall whether she read the ambulance notes although, if she did, she would have seen further evidence of probable appendicitis. By 1130 she had available test results showing raised neutrophils and left shift and toxic charge readings indicative of peritonitis and of sepsis. In short, she had every reason to expedite surgery if not at Liverpool then by way of a transfer to another hospital and she was well aware that adequate hydration and antibiotic cover were essential.

19. Although Dr. Ferreira agreed that, on all the evidence before her at 1130, there was a significant likelihood that there had already been a perforation of the appendix causing sepsis, her notes make no reference to appendix or peritonitis but simply make a diagnosis of *"acute abdomen"* which Dr. Nasser told the inquest is not a diagnosis at all but merely a *"red flag"* that something is amiss. By the same token, although it was clear at 1130 that urgent surgery was essential if Jacob's life was to be saved and that the Liverpool surgical team should have been engaged, no urgent surgical review let alone intervention was ordered and, instead, until about 1330, Dr. Ferriera contented herself with *"taking history, examination, blood tests, venous blood gas, inserting an NG tube, writing orders, writing notes and obtaining radiology."* Even then, Dr. Ferreira refrained from ordering an *ultrasound* which would have satisfied the boy's mother's request and her insistence that what they were dealing with was a burst appendix and its complications and might have been a far more useful diagnostic tool than x-ray.

20. I think it was at about 1530 that Dr. Ferreira telephoned the *VMO,* Dr. Berry, who directed her to transfer Jacob to the Children's Hospital at Westmead. The exact basis of Dr. Berry's direction is not clear. Dr. Berry did not examine Jacob, nor did he have access to the notes including Dr. Gounder's letter of referral. Of course, he had no opportunity to speak to Jacob's mother. How much of Jacob's history was disclosed to Dr. Berry is unclear. Dr. Ferriera is not certain what she told him and she admitted that she may have spoken of bowel obstruction. Certainly there is no reason to think that she said anything about appendicitis or that the degree of urgency attending Jacob's case was discussed. It is not clear that she mentioned the possibility of septic shock whose suspected presence, she says, influenced her decision in the selection of *NETS* to transport the boy to Westmead.

21. Dr. Ferreira telephoned Westmead and spoke to somebody there, presumably Dr. Patel. His recollection is that she informed him that Jacob would be coming from Liverpool Hospital for paediatric surgical review in relation to a possible bowel obstruction. There is no suggestion that Dr. Ferreira mentioned

appendicitis or peritonitis to Dr. Patel or the possibility of septic shock. Then she called for the assistance of the paediatric registrar, Dr. Sam Nassar, who appeared on the ward at about 1410. She asked him to review the patient and, in particular, to assess how urgently he required treatment. It is not clear why she did this since, on her version of events, she already knew that surgery was inevitable and that the matter was urgent. The decision had already been taken by her superior to transfer Jacob to Westmead she had already made arrangements with *NETS* to transport the child.

22. According to Dr. Ferriera, she decided that Jacob should be carried by *NETS* not because she thought that might be quicker than relying on the ambulance service – the evidence is that *NETS* is sometimes considerably slower and might involve a delay of up to four hours, but because she already thought Jacob might be in septic shock and she was frightened that his condition might suddenly deteriorate. In those circumstances, she thought it prudent to ensure that he be accompanied on the trip by a medical practitioner with all the technology that *NETS* would provide.

23. It was about 40 minutes until Dr. Nassar reviewed Jacob and there is no suggestion that Dr. Ferreira shared her fears of septic shock with him or, indeed, that she took any particular step in that regard. Evidently Dr. Nassar concurred in the view that Jacob had an acute abdomen and in the decision to transfer him to Westmead.

24. I think it is clear that Dr. Ferreira's care of Jacob was wanting in a number of respects. Her failure in the course of her examination adequately to consult the notes and read the *GP's* letter of referral, her failure to consider appendicitis, at least as a differential diagnosis and her failure to arrange an *ultrasound* led to a misdiagnosis and contributed to a degree of uncertainty, confusion and delay in Jacob's subsequent treatment. Meanwhile, Dr. Ferreira's failure to ensure prompt antibiotic therapy and adequate hydration placed Jacob in danger and may have led to very significant delay once Jacob got to Westmead. Further, it seems to me that Dr. Ferreira should have sought a surgical consult at Liverpool once she had completed her examination shortly after 1130 or arranged, then

and there, for a transfer to Westmead. And finally, having left this urgent matter so long, I think she might have contested Dr. Berry's direction - a direction given by the *VMO* without being able to see the boy, read the notes and gain close familiarity with the case, so that proper consideration might have been given by an experienced surgeon at Liverpool as to whether the time for a safe transfer to Westmead had passed and urgent surgical intervention at Liverpool was required.

Dr. Nassar

25. Dr. Nassar made a lengthy appearance at the inquest. I have some difficulty with his evidence because he told Ms. Stern of Counsel that his recollection of Jacob was essentially confined to what he had read in his own and other notes available to him but, on the other hand, he proceeded, in often very argumentative evidence, to make allegations the bases of which had not been noted. Whether his memory of events in March 2009 was jogged while he was in the witness box or he was telling the inquest what he believed *must* have been the case rather than what he remembered is not entirely clear but in several instances, I gained the impression that he was reconstructing the events of 26 March, 2009.

26. Dr. Nassar spent about half an hour with Jacob and his mother on 26 March, 2009. He says he examined the boy and took a history from Mrs. Belim but he says he never saw Dr. Gounder's letter referring to suspected appendicitis although, as *RN* Todd testified, that letter had been placed within the hospital notes. Nor did he read the ambulance notes. Further, it appears that Dr. Nassar never exchanged a word with Jacob. His explanation is that Jacob was too ill although, in his statement and in his notes, Dr. Nassar described Jacob as only *"mildly unwell."* It is difficult to reconcile that observation with Dr. Ferriera's fear that the lad was in danger of going into septic shock and it would be difficult to see *mild illness* as a proper reason for a medical practitioner, while examining an 8 year old child, failing to speak to the child so as to seek his or her input.

27. It is clear to Dr. Nassar that Jacob had a four day history of pain and had been vomiting over two days, that his abdomen was distended and tender, that his respiratory rate and his systolic blood pressure were elevated, that the 1154 blood tests showed *"left shift +," "toxic change +,"* and *"Rouleaux+"* - all signs of possible sepsis.

28. Dr. Nassar's notes record his impression that Jacob was suffering from *"acute abdomen - ? bowel obstruction"* secondary to faecalith, malrotation and/or infections. This diagnosis is significant because, despite Dr. Gounder's view, this is the diagnosis which accompanied Jacob to Westmead. Dr. Nassar's notes make no mention of appendicitis or peritonitis although this was the view being urged on Dr. Nassar by the child's mother. Further, there were signs, including the *"large and distended abdomen, rigid like a board"* pointing clearly to appendicitis and peritonitis as, at least, a real possibility. The x-ray did not unequivocally point to bowel obstruction, although it certainly did not rule it out just as it left open the possibility of perforated appendix with peritonitis. Nothing in Dr. Nassar's examination ruled out appendix and Dr. Nassar told the inquest that, in general terms, the most likely cause of peritonitis in a boy of Jacob's age is burst appendix. Why he rejected that possibility is unclear.

29. The x-ray report available to Dr. Nassar when he examined Jacob speaks of *"multiple gas distended loops of small bowel in keeping with a small bowel obstruction."* In his evidence to the inquest and in his statement and in his notes on examination, on the other hand, Dr. Nassar spoke of his impression that what he was dealing with was *large* bowel obstruction. Why he thought he was dealing with the large rather than the small bowel is unclear. He told the inquest that at the time of the examination he looked at the x-ray but the distension suggestive of obstruction appears in the small bowel rather than the large one.

30. Mrs. Belim's recollection is that Dr. Nassar told her *"your son has no sign of an appendicitis, 100 to 110% your son has not got appendicitis."* Dr. Nassar denies having said that and indicates that expressions such as *"100%"* or *"110%"* are not part of his normal usage although, in his evidence before the inquest, he used the expression *"100%"* on at least three occasions. Whether he used the

expressions cited by Mrs. Belim when speaking to her or not and however he came to his view in the course of his apparently perfunctory examination, it is clear that Dr. Nassar was determined that what ailed Jacob was large bowel obstruction and that he was not prepared to entertain any alternative.

31. In my opinion Dr. Nassar's failure to speak to Jacob on examination, his failure to read Dr. Gounder's letter or the ambulance notes, his description of the boy as being only *"mildly unwell,"* the paucity of his notes on examination, his failure to draw any conclusion from the rigidity of Jacob's abdomen – almost a diagnostic marker for a ruptured appendix, and his apparent confusion regarding small or large bowel obstruction all suggest a fixed view and a less than adequate intervention on his part. I think this view is bolstered by Dr. Nassar's failure when he completed writing up his notes at about 1425 to ensure adequate antibiotic therapy, so important in the presence of peritonitis and something which Dr. Ferreira had failed to do. In the event, Jacob was provided with *"Once Only and Nurse Initiated"* ampicillin and flagyl at 1540 and 1545, almost an hour and a half later.

32. Mrs. Belim alleges and Dr Nassar agrees that he showed her Jacob's x-ray which, evidently, showed no sign of appendicitis. She asked *"Can you see his appendix? Can you see his appendix?"* and Dr. Nassar admitted *"Not in this x-ray."* Mrs. Belin said *"I want an ultrasound"* and Dr. Nasser replied *"Let me show you the bowel obstruction."* Dr. Nassar admits that he mentioned bowel obstruction to her. Mrs. Belim says that when she persisted *"But can you see his appendix? The letter came from the Doctor* (Dr. Gounder) *saying he has appendicitis,"* Dr. Nasser advised her to *"get an ultrasound out of your mind."* Dr. Nassar's surprising evidence is that he cannot recall Mrs. Belim mentioning appendicitis although the insistence that Jacob had appendicitis had been the constant refrain of both parents throughout. He does agree, though, that Mrs. Belim asked for a scan although he says that he can't recall her giving a reason for that request. According to Mrs. Belim, she pleaded *"Let's just get an ultrasound, let's just get it (appendicitis) out of the way. Lets eliminate that"* to which she says Dr. Nasser replied *"We aren't going to do an ultrasound, we will talk to the surgical team about having surgery."* Dr. Nassar's evidence is that he

may have told Mrs. Belim that an *ultrasound* would not help and would only delay things although, in fact, an *ultrasound* would have proved a far better diagnostic tool than an x-ray and, in the event, there was plenty of time for an *ultrasound* to be undertaken. So Mrs. Belim's repeated requests for an *ultrasound* which might have put the matter beyond dispute went unsatisfied and, indeed, Jacob did not have an *ultrasound* until about 2040 at Westmead. It is tragic to note that, when eventually he did have one, the procedure confirmed appendicitis as a very viable, indeed, the preferred diagnosis.

33. According to Dr. Nassar, it was clear to him when he examined Jacob that the boy needed surgery and he went away to speak to a surgeon and Mrs. Belim's recollection is that, on his return at about 1500, he announced that *"they don't operate on children so you will travel by transport ambulance to Westmead Children's Hospital."* Mr. Belim's recollection is that Dr. Nassar told him that Jacob's bowel was either blocked or twisted and that *"we have to operate to fix it. It's common in kids. It happens."* And he says that, when Dr. Nasser returned, he told them *"the surgeon only does adults. He doesn't do children. Jacob has to be transferred to Westmead."* At this stage, Jacob had been at Liverpool Hospital for about four and a half hours since arriving there at about 1022.

34. It is not clear to me why both Dr. Ferriera nor Dr. Nassar submitted, apparently without protest, to the decision that Jacob would have to be transferred elsewhere without a review by a consultant. Both admitted an awareness that Jacob was in need of urgent surgical intervention. Dr. Ferreira must have known, as Dr. Nassar admitted, that a transfer to Westmead would necessarily involve considerable delay as, indeed, proved to be the case.

35. According to Dr. Nassar, it was his understanding that paediatric surgery was routinely available at Liverpool Hospital. He disagrees with *RN* Todd's evidence that, apart from orthopaedic surgery, paediatric surgery would not be performed at Liverpool Hospital except in the case of a life threatening emergency. She wasn't sure what might be considered a *life threatening emergency* such as to prompt paediatric surgery but, in all the years she had worked at Liverpool Hospital, she had never seen one. In contrast to *RN* Todd's evidence that *"in*

the years I have been at Liverpool, it has been a general policy that there will be no paediatric surgery. Orthopaedics is an exception," Dr. Nassar told the inquest that he knew that such surgery was quite readily available at Liverpool for children over four years of age and that he had seen instances of surgery on children there, including abdominal surgery. Although his evidence is that he was never involved in paediatric abdominal surgery at Liverpool, he said that he had been personally involved in an instance of paediatric surgery at Liverpool in the weeks prior to Jacob's admission. On the other hand, Dr. Nassar was able to say that, in March, 2009 there was no paediatric surgeon on staff at Liverpool. *RN* Todd's impression regarding the availability of paediatric surgery at Liverpool Hospital is far more reliable than is Dr. Nassar's.

Dr. Cracknell

36. One of the depressing features of this case is the risk that lessons arising from Jacob's death which should be learned may be missed at Liverpool Hospital. Dr. Richard Cracknell is the Director of the Emergency Department at Liverpool Hospital. He was not on the ward on 26 March, 2009. In his evidence, he seemed satisfied with the quality of treatment Jacob received on 26 March, 2009 and keen to defend it and he was unconcerned that general practitioners in the Liverpool area, the Ambulance Service, parents in the area and even elements of the medical staff at the hospital were and may still be unclear about Liverpool Hospital's policy regarding paediatric surgery. Evidently, there is no paediatric surgeon on staff and the policy is that, leaving aside orthopaedics and *ENT* and life threatening emergencies (which nobody seems to have witnessed), children do not undergo surgery at Liverpool. Dr. Cracknell admitted that there is no *written* policy to that effect and no signs or notices drawing attention to the policy and he conceded that no such information had or has been given to local *GP*s and certainly not to local parents. He told the inquest that he *thought* the ambulance service *might* have known although, in light of Mr. Clark's evidence, that seems unlikely.

37. It seems to me that, unless one were to take the view that an acceptably safe and efficient method of admitting children to a hospital, such as Westmead, where they might undergo surgery, is to route them through a hospital like

Liverpool Hospital where they can't, then notice of Liverpool Hospital's policy of restricting paediatric surgery to particular types of surgery should be widespread, at least among health professionals so as to allow affected parents to bypass the hospital and thus avoid confusion and delay. But evidently Dr. Cracknell does think such children should pass through Liverpool *en route* to surgery somewhere else so that they can be *worked-up*, their histories can be taken, blood tests, x-rays and *ultrasound* examinations can be undertaken, they can be examined and diagnosed, hydration can be checked and resuscitation started, medication and, in particular, antibiotic medication can be started, they can have a surgical review and then they can be promptly transported to the hospital where their surgery will take place.

38. Judging from Jacob's case, a sojourn at Liverpool Hospital *en route* to surgery at another hospital is likely merely to add another layer of inefficiency and delay. Jacob spent about seven hours there – hours which, in light of his deteriorating medical condition, he could ill afford. While at Liverpool, his history was taken in which the concerns of his mother and the findings of his treating *GP* were ignored or missed, x-rays were taken while an *ultrasound*, a far more useful diagnostic tool in the circumstances, was denied, he was misdiagnosed, he was left in a significantly dehydrated state, his antibiotic medication was delayed, he missed out on having a surgical review and his transfer to Westmead occurred hours later than it should have. In short, his visit to Liverpool was a tragic waste of time.

39. According to Dr. Cracknell, at Liverpool Hospital there is still no *written* protocol for medical staff detailing how children requiring surgery should be treated. **EXHIBIT 6** includes a letter of 28 July, 2011 from Dr. Colin McArthur, Director of Medical Services and A/Professor Mark Sheridan, Director, Surgery of Liverpool Hospital setting out actions taken by the hospital *"to improve the surgical management of children presenting at Liverpool."* It is not made clear whether those actions were taken since Jacob's death.

40. Paragraph 8 provides that *"every child brought into ED with a possible surgical illness has three levels of assessment namely (a) assessment by the ED*

Registrar and/or Staff Specialist; (b) assessment by Paediatric Registrar and/or Consultant Paediatrician; (c) assessment by Surgical Registrar and/or Consultant Surgeon."

41. In Jacob's case, of course, no staff specialist or consultant was made available and Jacob and his parents had to be content with Drs. Ferreira and Nassar but perhaps the real problem with the paragraph is that it seems to lock a child into three levels of consultation which may or may not be immediately available whereas, in many instances, the need for surgery is so clear and so urgent that, subject to the child being stabilised, there should be an immediate transfer to another hospital for surgery. It is not clear that this need to avoid delay is adequately recognised at Liverpool Hospital or that *ED* registrars have the option, in appropriate cases, to arrange for the immediate transfer of the patient to another hospital.

Preparation for Westmead

42. Jacob was handed over to *NETS* by Dr. Ferriera. At 1130 she had directed two fluid infusions but the administration of the first was delayed and it is not clear that the second was ever administered. Beyond that, Dr. Ferreira took no step to ensure hydration so as to properly prepare Jacob for surgery and avoid any delay in surgery once he arrived at Westmead. As a result, he was quite dehydrated by the time he left Liverpool. There is nothing in the notes to suggest that Dr. Ferreira undertook any examination of Jacob subsequent to her examination at 1130. She told the inquest that she had arranged a venous blood gas test before the handover although she could not recall its results. According to his parents, Jacob was in terrible pain when being placed on a stretcher and prepared for the ambulance and he *"started screaming even though he was on pain killers."* The *NETS* notes record the misdiagnosis of bowel obstruction which they had been given and record that Jacob was *very drowsy but rousable, tachycardic to 134 and febrile at 38.*

At Westmead

43. The ambulance carrying Jacob and his father finally got away from Liverpool Hospital at about 1723, almost seven half hours after his arrival there, and arrived at Westmead just after 1800.

44. Jacob and his father were joined by Mrs. Belim. The Liverpool misdiagnosis of *"? bowel obstruction"* was recorded on the admission documents at Westmead and the triage nurse repeated that *"x-ray shows bowel obstruction."* No mention was made of appendicitis. On triage, Jacob was accorded a *category 3 status*. He was *"pink and warm, dry lips and rousing easily."*

45. Jacob underwent further tests, some of which had already been undertaken at Liverpool and, finally, at about 2040 there was an *ultrasound*. According to Mrs. Belim, she begged for an *ultrasound* before being told that *"you can have an ultrasound but the wardsman is not free. You will have to take him yourself."* So she and her cousin Sandra wheeled Jacob through the corridors to the appropriate room where they waited for 15 minutes or so until the *ultrasound* operator finished eating and commenced the procedure. Mrs. Belim's recollection is that the person conducting the *ultrasound* examination told her *"He has a burst appendix"* and *"your doctor will get a report."*

46. Back in the ward, Mrs Belim says, they *"waited and waited"* and Mr. Belim says *"…they were treating us like it was a cut hand. They took their time as though they would just fix it at some point"* but finally, at about 2230, after what Mr. Belim describes as *"about 30 minutes while the medical staff searched for a missing consent form,"* Jacob went to theatre.

Surgery

47. Dr. Bhaveshkumar Patel who gave evidence via the *AVL* was a paediatric surgical registrar level *SET 5* (surgical education and training year 5 of 6) at Westmead in March 2009 and on duty at the time of Jacob's arrival at that hospital. With the paediatric surgical consultant, Dr. S.V.S. Soundappan, he saw Jacob in the Emergency Department sometime between 1800 and 1830 on

26 March. Earlier that afternoon, he had been contacted by Liverpool Hospital and had agreed to accept Jacob's transfer *"for paediatric surgical review in relation to a possible bowel obstruction."*

48. On examination, Jacob presented with abdominal pain and vomiting. His mucous membranes and his lips appeared dry and he was tachycardic with a distended, tender and guarded abdomen. He was very thirsty. He *"looked unwell."* Dr. Patel's evidence is that, contrary to the view at Liverpool, he thought from the outset that *"most likely it was appendicitis or burst appendix"* and, clearly, the appropriate course was surgery. Indeed, Dr. Patel told the inquest, his view was that surgery was necessary *as soon as possible* and that delay would threaten the prognosis. Nevertheless, he maintained that, prior to surgery, fluid resuscitation was required and he went on to say that, in addition to fluid resuscitation, there needed to be an *ultrasound* before surgery could prudently be undertaken. Both of these matters could and should have been properly dealt with at Liverpool and, evidently, they were not but, whether, at that late stage and once the diagnosis of burst appendix with peritonitis was accepted, there was any longer any point in an *ultrasound* is open to doubt.

49. As to the need for an *ultrasound*, by the time Jacob was reviewed by Dr. Patel there were already a great many signs pointing to appendix. Dr. Patel had already seen the distension and rigidity of the abdomen. He was already aware that Jacob could barely walk and he was aware of the vomiting. He knew that the *CRP* score was grossly elevated and the *WCC* score had risen from 10.9 at Liverpool to 13.5. These were highly suggestive of an appendix and, indeed, of a burst appendix and a deteriorating situation. Dr. Patel was aware too of Jacob's history of illness and pain over the past four or five days and he agreed with Counsel Assisting that, in general terms, *"the longer the delay in undertaking surgery, the worse the prognosis*." Perhaps the time for an *ultrasound* had passed and it is not clear why Drs. Patel and Soundappan wanted one, particularly if it carried any risk of further delay.

50. The Westmead notes demonstrate that fluid resuscitation was commenced at about 1800 and that further fluid was administered at 1915. From that point,

according to Dr. Susan Hale, the Anaesthetist, Jacob's fluids were stable and the boy was available for surgery. And yet, the decision to operate seems to have been delayed until around 2100 and surgery did not commence until 2300, some twelve and a half hours after Jacob first arrived at Liverpool Hospital and about five hours after his arrival at Westmead.

51. At the inquest, Dr. Patel advanced, as a reason for this hesitancy, the need to ensure that Jacob was adequately hydrated before surgery commenced but it appears that he had achieved that status by shortly after 1900 hours. Observations at that time confirmed Jacob's temperature at 38.5, his respiratory rate between 20 and 30 and his blood pressure at 150 systolic and 90 diastolic and both Dr. Patel and Dr. Hale told the inquest that these are consistent with child on whom it would be safe to operate. Both spoke, also, about other urgent cases which had occupied their attention later in the evening so perhaps it would have been best to have operated on Jacob as soon as possible after 1915 so as to *avoid the rush*. It seems likely that the fundamental reason why Jacob's surgery was not commenced at 1915, once he was considered to be adequately hydrated, was that the surgical team still hankered after a diagnosis of bowel obstruction and still had doubts about burst appendix. Although there seems to have been ample evidence available that Jacob's was suffering from a burst appendix and although Dr. Patel admitted as much, it was not until an *ultrasound* was performed and the results were to hand that the decision to operate was finally taken and final arrangements for surgery, including gaining parental consent, were put in place.

52. The findings at surgery included *"frank peritonitis, necrotic appendix entire length, dilated bowel loops and serocitis and adhesions ++…"* which indicates that the appendix had burst at least twenty four hours earlier and suggest an inflammatory process in the abdomen. The surgeons were unable to take the whole of the infection and it was clear that a second operation would be necessary in due course.

Dr. Soundappan

53. Dr. Soundappan's impression of Jacob when he saw him at about 1830 was that he was very sick and dehydrated with very dry mucous membranes, holding his abdomen tightly. He noted that Joshua's capillary refill was about 2 seconds, suggesting that his circulation was not compromised but Dr. Soundappan was unable to recall whether he had noticed what *NETS* had noted, namely that Jacob's feet were very cold.

54. Dr. Soundappan was aware, when he examined the boy and took his history, that Jacob had a five day history of abdominal pain and vomiting, exacerbated over the last 24 hours, which he told the inquest *"might"* indicate burst appendix with peritonitis. When pressed, he admitted that such would be the most common cause of such abdominal pain in a child.

55. Although he told Mr. Graham in cross-examination that, at about 1830, he had *"strongly suspected"* acute appendicitis, perforation and peritonitis, it seemed to me that Dr. Soundappan may have been somewhat less wholehearted in his diagnosis than Dr. Patel had been. The latter had thought from the outset that *"it was most likely appendicitis or burst appendix"* whereas Dr. Soundappan thought that Jacob *"might"* require surgery and *"would have liked to exclude bowel obstruction."* It seems to me, having regard to the test results available by 1830, that there was really no room for doubt that Jacob was suffering from burst appendix with peritonitis and, as Dr. Soundappan agreed, subject to the boy being fit for surgery and adequately hydrated, "*his prognosis grew worse with every hour that passed."*

56. Even if Jacob's level of hydration was not ideal, the notes make no reference to dehydration being such as to demand that surgery be delayed and there was no review of his hydration after 1830 until he went to theatre at about 2230 and no direction was given that Dr. Soundappan be advised as soon as Jacob had achieved a satisfactory level of hydration and was fit for surgery. Further, nothing in the notes suggests that Jacob was in a fitter state as regards hydration to undergo surgery at 2230 when he arrived at theatre than he had been at 1830 when he was examined by Drs. Patel and Soundappan. In the event, I do not

accept that the reason Jacob did not have surgery as early as about 1900 or 2000 had anything to do with his hydration. Instead, Dr. Soundappan seems to have hesitated until an *ultrasound* could exclude *complications* which he told the inquest might have included the presence of an abscess or a large collection of puss in the abdominal cavity. Certainly no effort was made to secure parental consent to surgery and no antibiotic therapy was commenced until about 2150 after Drs. Patel and Soundappan, in theatre, had been advised of the *ultrasound* results.

Dr. Hale

57. Dr. Hale was in theatre with Drs. Patel and Soundappan when they received the ultrasound results and when the decision to operate was finally taken. She cannot recall hearing any discussion about hydration or about Jacob's fitness for surgery and the readings which she consulted to determine his fitness were those which had been available at 1830.

58. In completing her *Preoperative Assessment* of Jacob, Dr. Hale told the inquest, she was aware of the necessary balance between the need for urgency and the degree of the patient's fitness but she had no difficulty in assessing Jacob as sufficiently hydrated for surgery. Indeed the indicators she relied on, including Jacob's vital signs, were those noted at 1830 so that it appears that surgery could have been undertaken as early as 1900 or 2000. Leaving aside whether Jacob really was fit for surgery and really was adequately hydrated, an early decision might have avoided any delay occasioned by the doctors finding themselves engaged with other patients as evidently was the case later in the evening.

59. Dr. Hale does not believe, she told the inquest, that Jacob was suffering from toxic shock at the time he underwent surgery. She says she was able to communicate with him and that he was cooperative as she put him to sleep and she doesn't think he was drowsy and believes that he was able to understand what was going on. In her examination and assessment of his level of consciousness, Dr. Hale made no notes but, perhaps that is a characteristic of

senior medical staff at Westmead. Neither Dr. Patel nor Dr. Soundappan made anything more than the most rudimentary notes.

60. According to Dr. Hale, she commenced the anaesthetic procedure at 2232 and surgery commenced at 2300. The notes indicate that Jacob's systolic blood pressure was raised until 0015 and then fell somewhat but the last recorded entry, 120 to 130, is high and, at 130, *"worrying."* She described the pulse rate of 160 as *"very concerning"* so that, she admitted, Jacob's condition at 0100 on 28 March as he regained consciousness was *"very worrying."*

61. The notes disclose that Jacob received a high volume of fluid during surgery although, Dr. Hale said, not an abnormal
amount for a child undergoing appendectomy and, at any event, she said, his fluid requirements were dictated by his vital signs which were abnormal *"because of the septic process."* Despite a heart rate of 156 recorded at 0221, Dr. Hale believed that Jacob had *"responded well"* to surgery and, for this reason, she had been comfortable with the post-operative arrangements which were made for him.

Post-operative care

62. Mr. Belim estimates that it was about 0200 on 27 March when he saw the surgeon who told him *"the operation went well but I couldn't get all the infection because it was so bad. You might have to bring Jacob back for another operation to get the rest of the infection if the antibiotics don't work. You have one sick child on your hands… …Appendicitis in a child on a scale (sic). From here is good. In the middle is bad. Your son's infection is off the scale, way up here… …Prepare yourself for the next 24 hours because it's going to be crucial. He's either going to live or die. I've got to clean him up…"*

63. Dr. Hale signed the *Preoperative Assessment* form which was written by her registrar, Dr. So, and which provided orders for Joshua's post-operative care**.** I understand that these were the joint responsibility of the anaesthetist and the surgical team. The document calls for Jacob to remain in the ward with hourly observations. The instructions for Jacob's post-operative care involved routine

observations in the ward of heart rate, blood pressure, oxygen saturation and urine output together with, analgesia, antibiotic therapy and the careful maintenance of fluid balance. Effectively, *"routine"* meant hourly. One might have thought that, considering his extremely poor condition, Jacob would appropriately have been accorded very close, almost constant, monitoring in the *Paediatric Intensive Care Unit* and Associate Professor John Raftos, called as an expert by the Coroner, believes that this is what should have happened and that the prescription for Jacob's post-operative care was inadequate.

64. Dr. Hale's response to that observation is that, as he emerged from surgery, she thought that Joshua had responded well to treatment and, in particular, to fluids administered during surgery. She told the inquest that, at the time and even in hindsight, Jacob did not need *intensive care*. It is not clear to me how she can maintain that view given Jacob's heart rate of 156 bpm at 0221 and given it had not been possible to get all the infection during the first operation so that Jacob remained infected and very unwell as he emerged from surgery. But Dr. Hale maintains that that very high heart rate was merely a result of drug therapy rather than an indicator of distress and that, notwithstanding his continuing infection, hourly observations were sufficient for him.

65. In this view she was joined by Dr. Soundappan but evidently not by Dr. Patel. Dr. Soundappan rejected the suggestion that the volume of fluid which the boy had required during surgery, like his vital signs, had indicated the possible onset of septic shock and therefore the need for more than the routine observations that had been ordered. He was prepared to countenance the concept of *close observation* and even the suggestion of a *high dependency* bed, but he was not prepared to admit that Jacob should have been sent to the *ICU*.

66. For his part, Dr. Patel told the inquest that, although he had turned his mind to that question, his view was and had been that Jacob had responded very well to his treatment and was in a satisfactory condition so that he *"could not say"* that he needed to be in the *ICU* and that *"routine obs"* would not be sufficient during the recovery period. But he repeated that the decision as to Jacob's post-operative care had been the decision of his *"seniors"* being Dr. Soundappen and

the anaesthetist, Dr. Hale and he left me in little doubt that, had the decision been his, Jacob may have been have been accorded a significantly higher level of supervision and support.

67. Dr. Hale told the inquest that she had realised that some of Jacob's readings as he emerged from surgery had been *"abnormal"* but she had regarded him as *"relatively stable"* and had formed the view that any changes would be adequately picked up by hourly observations. As far as I could make out from her evidence, she remains of that view and, even with the wisdom of hindsight, would have taken the same course.

68. I repeat that it is not clear how Dr. Hale saw Joshua's admittedly abnormal state as *"relatively stable"* and I do not accept that her view in that regard is correct. At 0145, his heart rate was 145 and rising to 170 and, when she left the hospital sometime after 0300, it was fluctuating between 150 and 160 *bpm*. His respiratory rate rose from 28 at 0221 to 32 at 0251. His blood pressure rose from 111/71 at 0221 to 114/72 at 0241 and back to 112/72 at 0301. Jacob was seen as *"very sleepy"* – potentially a worrying sign, whereas, at the start of surgery, Dr. Hale had seen him as cooperative, communicable and not drowsy.

69. Further, Dr. Hale had been aware that Jacob's appendix had perforated and she told the inquest she had assumed peritonitis. She must have known that the peritonitis was at least potentially generalised and she was aware that it had not been cleared up at surgery and that Jacob remained infected. She must have known there was a potential for shock, septic or hypovolemic. It seems to me that it was clear that, from the time he emerged from surgery, Jacob's condition was highly unstable and threatening. Dr. Raftos gave evidence about the capacity of many children to compensate and, in effect, to *"soldier on,"* longer than adults but he said that, once they have reached the end of their capacity, children's decompensation is likely to be a sudden and rapid collapse as, indeed, Jacob seems to have experienced at about 1500 on 27 March, 2009. If Dr. Hale was aware of that characteristic of children, she seems to have overlooked it when typifying Jacob as *"relatively stable."*

70. Dr. Hale and the surgeons had agreed that, should Jacob's condition deteriorate, then his level of monitoring might be increased, either in the ward or in the *PICU* but, in the event, nothing came of that agreement.

Dr. Thacker

71. Dr. Kunal Thacker was the paediatric sub-specialties registrar on duty at Westmead in the early morning of 27 March, 2009 and, as such, it fell to him to care for children after surgery. Sometime before transferring Jacob from theatre, Dr. Patel phoned him and asked him to review Jacob in the ward at 0430, particularly with regard to his hydration. Dr. Patel mentioned that there would be an *ICU* review later in the morning. Dr. Thacker saw Jacob at 0430 as requested and then, again, because he had a particular concern, at 0630. On both occasions, the heart rate was 162 – *"worryingly high"* according to Dr. Thacker. In accordance with newly introduced protocols at Westmead, that heart rate would mandate a call to the *Rapid Response Team* but such was not the case in 2009 and Dr. Thacker did not refer Jacob to *ICU,* chiefly because, noting an apparently deteriorating condition and suspecting a state of *pre-renal failure*, he had prescribed additional fluid for the boy and needed to see how he responded. Nevertheless, Dr. Thacker was conscious that Jacob was deteriorating and he told the inquest that, had he had available to him the results of the most recent blood tests which, when they did become available, showed pH at 7.24 and strongly suggested acidosis, he would have transferred Jacob to *PICU* without delay.

72. Urinalysis at 0630 showed a persistently low output which was a matter of great concern suggestive of failing kidneys. According to Dr. Thacker, either Jacob was experiencing *"third spacing"* where there was seepage of fluid into the intramuscular space or he was going into septic shock. The temperature was 40.5. Dr. Thacker thought that all the signs were that Jacob was on the brink of sudden and catastrophic deterioration. So he telephoned *ICU* seeking help and was told to wait for the *ICU* registrar to come to review the patient. When the *ICU* registrar came on the ward, he recommended more fluid but before Dr. Thacker could respond, Dr. Patel came on to the ward and responsibility passed to him. Dr. Patel was surprised to see that the *ICU* review which had been

ordered had not taken place and, shortly after, he handed over Jacob to another team and went off duty. Dr. Patel had no further involvement with Jacob.

Jacob's Last Hours

73. Jacob remained on the ward until late on 27 March, 2009 although, at one point, he was transferred to a position near the nurses' station. The nurse in charge of the 40 bed ward was *RN* Stephanie Webster who recalls that, when she came on duty, Jacob was febrile, tachycardic with low urine output and a distended abdomen. He looked unwell and his temperature hovered around 40 degrees and he was slightly tachypnoeic with poor urine output less than 1ml/kg/hour. On the other hand, *RN* Webster's recollection is that Jacob was oriented to time and place and able to vocalise. Ms. Webster recalls that the surgical team, evidently including Dr. Soundappan, examined him at about 0815. Dr. Vasant Rajan was the on-duty resident medical officer and he first met Jacob that day at about 0815 when he accompanied and scribed for Dr. Soundappan and Dr. Charles, the paediatric surgical registrar, as they examined him. Dr. Rajan's notes describe a fever spike of 40 degrees. Dr. Soundappan says that he asked the registrar and the resident to monitor fluids, to obtain blood tests and to speak to *ICU* but Dr. Rajan's recollection is that he *"was not asked to organise an ICU review at that point"* and that *"the plan was as recorded: 'bolus normal saline. naso-gastric output replacement. chest physio. IV antibiotics. Re-dose gentamicin … …nil by mouth. Monitor urine output and titrate fluids accordingly.'"*

74. Dr. Rajan checked Jacob's fluid status at least twice between 0815 and 1300 and his notes suggest that the boy remained dehydrated. According to *RN* Webster, the Pain Management Team attended at about 0950 and Jacob's patient controlled analgesia morphine was changed *"so he could receive a bolus dose as well as a continuous background infusion of morphine."* Dr. Rajan continued to follow up on Jacob's condition during the day and it is *RN* Webster's recollection that he *"was on the ward frequently throughout the day and reviewed Jacob several times"* and she says she kept Dr. Rajan aware of Jacob's vital signs.

75. *RN* Webster's view, expressed in her statement and in her evidence to the inquest, is that she *"did not have any concerns about Jacob being cared for on the ward"* but it seems to me that there were certain aspects of Jacob's care on the ward which may have been improved upon had he been in *PICU*. In the first place, although *RN* Webster noted hourly observation between 0800 and 1300, I wonder if these were sufficient given Jacob's condition and noting, in particular, that on each occasion, Jacob's respiratory and heart rates were elevated. It appears, too, that, during that period, Jacob's blood pressure was taken not hourly but only twice – at 0800 and 1200 whereas one might argue that a closer watch should have been kept on his blood pressure given that it had risen overnight from 110 to 155 systolic.

76. Jacob's *pain score* seems to have been incorrectly or at least incompletely chartered in terms of the *Guidelines for the Measurement of Pain Severity*. As to the *Pain Management Observation Chart,* the *pain score* was entered by *RN* Webster each hour between 0730 and 1300 with the letter *"A"* indicating that Jacob was asleep. Nevertheless, the *pain score* as recorded did little to assist Jacob because it failed to distinguish between sedation caused by morphine and lethargy due to his illness and it is not clear that any attempt was made to distinguish between the two. And yet, better information about the origin of his lethargy might have been important in terms of planning Jacob's management and treatment.

77. The *Fluid Balance Chart* was kept by *RN* Webster between 0900 and 1500 on 27 March, 2009 on an hourly basis. Early input of 100, 20 and 150mls reflects overnight losses but, leaving those aside, it seems that the in-going fluid far exceeded the output which, Ms. Webster agreed, is *"a sign of a sick child."* The chart demonstrates that, at 1200, the hourly output dropped from 80 to 40mls. *RN* Webster described this as *"a one off"* in the sense that, at 1300, output is recorded as having risen to 70mls but, at 1500, 1600 and 1700, it stood at 32, 36 and 20mls respectively. One possible explanation for this alarming fluctuation is the leaking in-dwelling catheter of which *RN* Webster spoke but it seems to me that another possible explanation is, as she conceded, *"an alarmingly deteriorating picture."*

78. The reality appears to be that, on 27 Match, Jacob was unstable except in the sense that he was steadily deteriorating. His temperature spiked at 41 degrees at 1445. Between 0530 and 1000, his systolic blood pressure climbed from 115 to 140 which *RN* Webster agreed might have been a sign of developing septic shock.

79. *RN* Webster's entry in the *Progress Notes* at 1230 on 27 March, the only complete note she made regarding Jacob, describes him as *"very sick," "drowsy but rousable"* and *"upset at times."* But the physiotherapist's note at 1500 has Jacob as *"drowsy and difficult to rouse ++."* *RN* Webster told the inquest that she had never seen Jacob as answering that description and perhaps the physio is wrong in that regard but I think Jacob was too ill, by that stage, to allow any discrepancies to creep into the notes.

80. In monitoring Jacob, *RN* Webster never carried out any arterial blood gas tests for the very good reasons that she was not trained to do so and such tests were not directed while Jacob was in her care. Nor was she ever told that Jacob should be weighed.

81. None of these matters is cited as any sort of criticism of *RN* Webster. It seems to me that she was aware that Jacob was very ill indeed and she told Mr. Graham of Counsel that she was aware of the risk of septic shock, dehydration and the development of renal failure. She described Jacob as *"the sickest boy in the ward."* She admitted that, when she came on duty, Jacob's body was trying to cope with septic shock and that, at the very least, he failed to improve throughout her shift. In those circumstances, I think she gave Jacob all the attention she could but she was busy and in charge of a very busy ward and I respectfully disagree with her view that Jacob needed no more attention and no more constant monitoring than she could provide for him.

82. *RN* Webster handed over to *RN* Florentina Idquival at about 1400. Ms. Idquival reviewed Jacob at 1600 and again at 1620 and, because she was worried about his condition, she spoke to Dr. Rajan and asked him what was the plan for

Jacob's treatment. He told her the plan was to bring down his temperature and, because she "*was not happy with this plan and thought more should be done,"* she called *PICU* and *"told them she required more help as Jacob was a very sick child and I wanted assistance."* Then, after a discussion with a nurse practitioner, *RN* Brad Ceely, she *"called an arrest*" which she explained *"is a call made to escalate the request for care."*

83. Dr. Rajan had been alerted to a further temperature spike - he thinks in the late afternoon and Dr. Soundappan thinks about 1300. Dr. Rajan reviewed him and went up to theatre to confer with Dr. Soundappan who told him that *"Jacob's clinical condition was consistent with the severe appendicitis he had seen in the operation and also that he was now on appropriate antibiotics."* Dr. Soundappan did not ask for any changes in Jacob's management but, because he was concerned about Jacob being febrile and tachycardic and because he himself could not leave theatre, asked Dr. Rajan to arrange a *PICU* review. When Dr. Rajan spoke to *PICU* he was told that *RN* Idquival had alerted *PICU* shortly beforehand.

84. The medical arrest team was quickly at Jacob's bedside. Mr. Belim's recollection is that Jacob's eyes *"started going funny"* and then *"rolled back and he just passed out."* Nurses and doctors came running and somebody went off to get a *pinpoint* torch *"to check his eyes."* Jacob could not be wakened. According to Dr. Rajan, Jacob's *GCS* had dropped but his cardiorespiratory status was unchanged. The parents were told *"…the drugs aren't working from downstairs. We have to give him stronger drugs"* and he was transferred to *PICU* where, as Dr. Rajan reassured Mr. Belim, *"he could be closely monitored and treated."* According to his father, Jacob was rushed up to *PICU* and placed into an induced coma *"with a tube down his throat so he could breath by machine…"* and *"…antibiotics* (were administered) *through the main artery in his leg because they said the antibiotics weren't working*

85. When Dr. Soundappan finished in theatre, he saw Jacob in *PICU*. Jacob was intubated and receiving inotropic support and it was clear that he was gravely ill. Dr. Soundappan asked that abdominal pressures be monitored and he asked to

be notified at home *"if the pressures were over 20 as I was concerned about abdominal compartment syndrome"* but, in the event, attempts to contact Dr. Soundappan later that night were unsuccessful.

86. Dr. Jonathan Gillis, the on-duty specialist in the *PICU* unit reviewed Jacob on his admission there after about 1830 on 27 March, 2009. Dr. Gillis reports that Jacob *"was in a critical and perilous condition. He was in profound shock. He was only minimally responsive with groaning to deep pain, had very poor peripheral perfusion, tachycardia and wide pulse pressure. He had marked abdominal distension… …*(and) *life threatening septic shock and/or ischaemic gut."* Dr. Gillis says he spoke to the parents explaining the situation and it may have been he who Mr. Belim recalls as saying *"Go in there. Kiss your son, hug him and tell him you love him because it might be the last time that he gets to hear you. After we take him to surgery, if his heart stops once more, we might not be able to get him back."*

87. Jacob was not responding to the maximum *ICU* treatment and, as the position grew more desperate, it was decided to take him back to theatre for an emergency laparotomy. Mr. Belim was told that Jacob had to go back to surgery but that, first, he needed to be stabilised and his swelling reduced. According to Mr. Belin, *"they cut his stomach open in front of Yvonne and I."* Once stabilised with a heartbeat of 134 and a temperature of 36, he was taken back into surgery.

88. At about 0228 on 28 March, 2009, Jacob died while undergoing emergency laparotomy. He was 8 years of age.

Dr. Raftos

89. Associate Professor John Raftos is an expert in the area of emergency medicine. He practices it as a senior specialist at St. Vincent's Hospital, Darlinghurst, Sydney Hospital and Sutherland Hospital and he teaches it at the University of New South Wales. His expertise is well known and acknowledged in the Coronial jurisdiction as elsewhere in *NSW* Courts and it is not necessary for me to detail his qualifications and experience except perhaps to say that he is not a specialist in paediatric emergency medicine. Nevertheless, particularly at

Sutherland, he has worked in Emergency Departments with many juvenile patients and has very often been required to assess juveniles post-operatively, although not as frequently as pre-operatively.

90. At the invitation of the Registrar of this court, Dr. Raftos provided three reports, one on 2 October, 2009, one 20 February, 2010 and the other on 30 May, 2011. To the extent that his conclusions in those reports differ, as he admitted to Mr. Fordham of Counsel they do, Dr. Raftos explained that his ultimate view arose after more and better consideration of the material provided him – material which he admitted had been available to him from the outset. I have found much of what Dr. Raftos has written and said helpful but not determinant of the matters which I must decide and so I have not been disconcerted by any discrepancies among the reports. I am grateful to Mr. Fordham for having pointed them out.

91. One aspect of Dr. Raftos' evidence which I unreservedly accept is his statement that, in a sophisticated country like Australia, fatality due to appendicitis is very rare and, where there is a fatality, it is usually due to perforation, default and/or delay in hydration and/or delay in controlling sepsis by way of antibiotic therapy and/or surgery. All of those seem to have been present in Jacob's case.

92. Another aspect of Dr. Raftos' evidence which has not been challenged and which I accept is that, generally, children have a better capacity for compensation than do adults and, in consequence, will often look to be in a better condition than, in fact, they are. But, when they reach the end of their capacity, their decompensation more often than not will be abrupt and catastrophic. They are likely to *"drop off"* very quickly. It seems likely to me that something of this effect can be seen in Jacob's case where ambulance officers thought that he had been adequately hydrated whereas, a very short time later, Dr. Soundappan and Dr. Patel at Westmead formed the contrary view. Dr. Raftos was clear that, in point of fact, Jacob had been inadequately hydrated at Liverpool and he pointed to Liverpool's *"Paediatric Intravenous Fluids Record"* where he thought *"1/2 normal saline"* amounted to maintenance but not replacement therapy and that the addition of dextros was inappropriate and might have contributed to Third Spacing. Given that Joshua had vomited 500mls, Dr. Raftos thought the failure

to resuscitate him with bolus doses amounted to inadequate treatment. By the same token, he said that the administration of antibiotics, first prescribed at about 1130 but not administered until 1540 amounted to a *"serious omission"* as, of course, it did.

93. Dr. Raftos' current opinion is that *"the treatment Jacob received for his perforated appendix was inadequate in several respects."* In that regard, he points to Dr. Khan's failure even to suspect appendicitis. Secondly, he points to approximately seven hours delay at Liverpool Hospital when *"doctors did not appreciate that Jacob's presentation indicated that he had peritonitis which is a surgical emergency"* and to what he regarded as *"unnecessary delays"* during the almost four and a half hours during which Jacob remained at Westmead until he was taken into theatre. And then, Dr. Raftos is critical of the failure of medical staff at Westmead to ensure Jacob's post-operative management in the *PICU* in circumstances where Jacob's persisting peritonitis warranted more constant and intensive monitoring and support than was available on the ward. All of those are views which, for reasons I have outlined above, I have reached quite independently of Dr. Raftos. Finally, his evidence is that, earlier laparotomy for peritonitis would have significantly increased the likelihood of Jacob's survival.

94. Dr. Raftos told the inquest that, not unlike Liverpool Hospital, St. Vincent's does not ordinarily operate on children but he pointed out a number of differences between those two hospitals. Firstly, he said, *"we (at St. Vincent's) make sure that (children needing surgery) are well enough to be transferred to Randwick. St. Vincent's policy is that such children must be seen by a specialist… …We would never keep a child more than 10 or 15 minutes unless they need resuscitation and never more than an hour."* Indeed, he went on to say that, if urgent surgery is required for a child and an early transfer by *NETS* is impossible, St. Vincent's will sometimes be prepared to send the child by ambulance, accompanied by one of its own doctors. And, further, he went on to say that St. Vincent's restrictive policy regarding paediatric surgery is well known in the local medical profession and to the ambulance service which reduces the number of children presenting there for surgery . The contrast is stark.

95. Dr. Raftos was taken to the Liverpool Hospital *Flow Sheet* describing Jacob's condition and treatment from his arrival there at 1031 on 26 March until 1154. At 1154, one and a half hours after arrival at Liverpool and some ten and a half hours before surgery at Westmead, Jacob's sodium level was 127mmo/L indicating that he was *"unwell."* His *CRP* stood at 380.mg/L *"dramatically high and suggestive of inflammation or an infective process in the abdomen."* Dr. Raftos' view is that these indicators *"should have rung warning bells."* If the results indicating *"Left Shift +," "Toxic Change +,"* and *"Rouleaux +"* were available while Jacob was still at Liverpool, Dr. Raftos says, they suggested serious bacterial infection. In his view, it should have been obvious to any medical practitioner dealing with Jacob at Liverpool Hospital that his situation was very serious and that he needed urgent surgery and that delay was out of the question. He says that, when she examined him at 1130, Dr. Ferreira should have been able to diagnose appendicitis, should have obtained an urgent surgical consult and, if that proved unavailable, should immediately have transferred him for surgery. In his view, delay was not an option.

96. On the topic of Jacob's post-operative care, Dr. Raftos commented on Dr. Patel's note at 0645 on 27 March:- *"D/W surgical registrar (Dr. Patel). Possible septic shock/third spacing may need ICU monitoring. Surgical registrar will decide."* Dr. Raftos' opinion is that *"this was an appropriate comment as Jacob did have septic shock requiring invasive haemodynamic monitoring, fluid resuscitation and inotropic support in an Intensive Care Unit."* Dr. Raftos feels that the failure to admit the boy to *PICU* post-operatively *"represents a major departure from what would have been widely accepted by peer professional opinion in Australia in 2009 to be competent professional practice."* Whether or not it does, it seems clear that, for a boy in Jacob's condition and, particularly, where there was the possibility of sudden collapse, hourly observations available on the ward would be no adequate substitute for the constant monitoring available in *PICU*. Invasive haemodynamic monitoring of Jacob *via* an artery as recommended by Dr. Raftos could have been provided in *PICU* and would have provided constant and immediate information and support in the shape of more efficient hydration, adrenalin supply and administration of antibiotic therapy. It is difficult to imagine any patient with a greater need.

97. Dr. Raftos explained the mechanism of Jacob's death. He said that Jacob's appendix burst, probably about 24 hours before surgery, and toxic bacteria invaded the peritoneal cavity giving rise to pathology and, ultimately, to shock. In Jacob's case that shock may have been septic shock or hypovolemic shock or a combination of both but, at any event, shock is likely to have affected Joshua in a number of ways of which increased heart rate, vasoconstriction and preferential shunting are among the more likely. The records suggest increased heart rate and the reports of his cold extremities suggest the presence of preferential shunting and/or vasoconstriction. In Dr. Raftos' view, Joshua would have compensated to the limit of his capacity until a sudden decompensatory collapse, reaching *a point of no return* sometime on the afternoon of 27 March when, as the evidence suggests, he declined rapidly and, ultimately, his heart failed.

Possible referrals

98. I am asked by Mr. Graham of Counsel to refer Drs. Ferreira and Nassar to the *Health Care Complaints Commission (HCCC)* or the *Australian Health Profession Registration Authority (AHPRA)*. I am not sure that *APRAH* rather than various state authorities is the appropriate organisation to entertain such referrals but, at any event, I have decided to make no referral. I hope Mr. and Mrs. Belim will come to understand my reasons for that decision. The coronial jurisdiction is not ordinarily involved in punishment or penalties and I think should limit its referrals to professional bodies to those rare cases where no other avenue to seek relief or justice is available. Such is not the case here. I have made various findings regarding both Dr. Ferreira and Dr. Nassar which are available to Mr. and Mrs. Belim to do with as they wish. I don't think it is appropriate or helpful that I do any more in that regard.

Possible Recommendations

99. A number of proposals for recommendations were made by Counsel and there is a certain measure of agreement between them and particularly between Ms. Stern and Mr. Fordham. Accordingly most of the recommendations I will make, directed to usefully streamlining the transition of paediatric surgical patients from

Liverpool Hospital to a hospital, probably the Children's Hospital at Westmead, where they can receive the surgery they need, will be uncontroversial and, I hope, helpful. I intend a further recommendation designed to notify general medical practitioners in the Liverpool district and the Ambulance Service of the policy of Liverpool Hospital regarding most forms of paediatric surgery. In coming to that decision, I have given close consideration to the opposing submission of Mr. Fordham of Counsel but it seems to me that one of the lessons to be learned from what happened to Jacob is that where there is an *intermediate* hospital placed between a juvenile patient requiring surgery and a hospital which provides such surgery, there is likely to be unnecessary delay. That was certainly the case with Jacob at Liverpool where no good purpose was served and seven hours were lost. Clearly had Dr. Gounder or the ambulance officers known of the unavailability of paediatric surgery at Liverpool, they would have chosen Westmead. I think other practitioners should be given the choice of making informed decisions and, on the basis of what happened to Jacob, I disagree with Dr. Cracknell that a registrar at Liverpool Hospital is better placed that a local *GP* to make a timely and informed initial decision as to the likely need for surgery.

Findings

My findings are that **Jacob Leonel Belim, born on 7 June, 2000, died at about 0228 on 28 March, 2009 at Royal Alexandra Hospital for Children at Westmead when his heart failed as a result of septic and/or hypervolemic shock consequent on a burst appendix leading to peritonitis.**

Recommendations

I make the following recommendations:-

1. **To *South Western Sydney Local Health District* and to *Sydney Children's Hospital Network,* that steps be taken to ensure the ready availability to medical and nursing staff at the emergency departments**

of Liverpool Hospital and the Children's Hospital at Westmead of a one page guideline regarding the circumstances in which appendicitis may call for urgent surgical treatment and the steps to be taken in such instances;

2. **To South *Western Sydney Local Health District,* that steps be taken to ensure the ready availability to medical and nursing staff at the emergency department at Liverpool Hospital of a protocol to ensure the prompt and efficient transfer of paediatric patients requiring surgery not to be performed at that hospital such protocol to include**
    - **(a) a requirement that the degree to which surgery is urgent be documented,**
    - **(b) a requirement that the mode of transport chosen and the estimate of time required in which to complete the transfer to another hospital be documented,**
    - **(c) a requirement that, subject to the need to avoid delay in transfer, the paediatric patient be reviewed by the most senior clinician present in the emergency department at the time,**
    - **(d) a requirement that the paediatric patient be appropriately monitored until transfer and that such monitoring be documented,**
    - **(e) a requirement that, in the event that transfer is delayed, the changing needs of the paediatric patient requiring surgery be considered and responded to and that those needs and any responses be documented, and**
    - **(f) a requirement that, in the event of a decision to transfer a paediatric patient requiring surgery to another hospital, the medical officer making that decision liaise with the hospital to which the patient is to be sent with a view to ensuring that, subject to the need to avoid delay as regards the transfer, the patient is properly prepared for surgery and that such attempts to liaise and any instructions of the hospital to which the child is to be transferred and any preparations for surgery be documented;**

3. **To *South Western Sydney Local Health District* that steps be taken to advise paediatricians and general practitioners in the area served by Liverpool Hospital and the NSW Ambulance Service and to keep them advised of the policy of Liverpool Hospital regarding the provision of paediatric surgical services.**

Magistrate Scott Mitchell,
NSW Deputy State Coroner.
Glebe.
12 August, 2011.