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Medical report on Hayley Fullerton

Date of Birth: 6th October 2008

This report has been prepared by Dr Rob ROSS RUSSELL, consultant paediatrician Addenbrooke's Hospital at the request of Irwinmitchell, solicitors

The report has been compiled with reference to copies of:

- Notes from Birmingham Children's Hospital
- Notes from Belfast Health and Social Care Trust
- GP records
- Statement from Paula Stevenson
- Statement from Edward Stevenson
- Statement from Sylvia Stevenson

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Personal Background

1. I have been qualified since 1982, and have spent nearly all of that time in paediatrics. My experience in intensive care began in 1983 (in neonatology), and from 1984 I have worked in paediatric intensive care. My early experience was on the Paediatric Intensive Care Unit (PICU) at Great Ormond Street's Hospital for Sick Children, and I have also worked at St. George's Hospital, Tooting, The Royal Brompton Hospital, Chelsea and King's College Hospital, Denmark Hill. In 1992 I moved to Addenbrooke's Hospital, Cambridge as the consultant in charge of the PICU.

2. I have also trained in respiratory paediatrics, with training posts at Great Ormond Street, The Royal Brompton Hospital, and King's College Hospital. My current post at Addenbrooke's involves care for children with respiratory conditions including cystic fibrosis and asthma, and I have a particular interest in children with scoliosis and respiratory muscle disease.

3. I was the lead consultant for PICU from 1992 - 2000. For the next 7 years (2000 - 2007) I was the Clinical Director for the paediatric department. I have sat on national advisory groups on high dependency care, and am currently chair of the Intensive Care group of the European Respiratory Society (2006 -). All my jobs have involved the care of critically ill infants and children, and I have published around 60 scientific papers on related subjects.

4. In this report I have been asked to review Hayley's care during her admission to Birmingham Children's Hospital in October 2009.

5. Hayley was born in Belfast and was diagnosed at that time to have pulmonary atresia with a ventricular septal defect. She had a Blalock-Taussig shunt inserted at Belfast on 1 December 2008. In view of the retirement of the Belfast surgeon the family were referred through to Birmingham Children's Hospital and Hayley was admitted to their wards on 12 October 2009 for definitive surgery.

6. This was undertaken on 14 October and the operation was successful. However, Hayley's post-operative recovery was quite prolonged. She had two failed extubations.

7. The first of these was around midnight on 19 October. Following the extubation Hayley's oxygen requirements increased to around 65% and in view of this she was reintubated.

8. The notes record that she had copious thick secretions and her chest X-ray taken at that time showed some collapse and consolidation on both the right and the left side of her lungs (page 36). It was also noted that there was a small pneumothorax on the film (page 551) and bilateral effusions.

9. Following reintubation the medical notes suggest that her endotracheal tube was too long and it was therefore moved back 0.5cm, but there is no comment about this on the X-ray report.

10. Over the next few days Hayley received continuing support in the PICU. Her liver function tests were deranged with an ALT that was rose to 1260 IU/l on 20 October. She was also noted to have a distended abdomen and amongst other medications was started on a Frusemide infusion.

11. The second extubation was around 15.30hrs on 20 October. Following extubation she was showing a good respiratory effort but she was given a short nasal prong to assist with her breathing. She maintained her ventilation for around 12 hours but at about 3.30am on 21 October she developed increased work of breathing, which was thought to be possibly related to a mucous plug.

12. A chest X-ray around this time showed right upper lobe collapse/consolidation and some loss of volume in the right lower lobe as well, together with some left lower lobe consolidation and a somewhat elevated right hemidiaphragm.

13. An echo of her heart was reassuring. The notes comment that this showed a mildly dilated left ventricle but good contractility.

14. Hayley was maintained on ventilation in the PICU until 23 October when she was extubated in the morning onto face mask ventilation (BiPAP). She tolerated this well and a chest X-ray was felt to be steadily improving. She had an ultrasound of her diaphragms which demonstrated appropriate movement of both hemidiaphragms.

15. On 26 October she had some collapse and consolidation in the left upper lobe on chest X-ray. At this stage she was tried on CPAP but this was not tolerated and she was put back onto BiPAP. By 31 October she was felt to be sufficiently improved to be transferred to Ward 12. This followed two days during which her ventilatory support had been weaned off with five hours off the CPAP on 29 October and continuously off CPAP on 30 October.

16. On that day she was noted to have some mild to moderate respiratory distress still with evidence of intercostal recession and an oxygen requirement of up to 60% (page 79).

17. On being transferred to Ward 12, Hayley's family was told that she would be on or next to the HDU but she was moved to the open ward. On 1 November it was suggested that she be moved to Ward 11 and the family was concerned about this and she was, therefore, kept on Ward 12 for a further day, being transferred on 2 November.

18. The family were promised Hayley would be near HDU on this occasion but in the event she was put close to the door to the ward which left the family very worried.

19. The extent of their concerns is demonstrated by the statement of Paula Stevenson. Hayley's Mum decided, with the family, that she would stay up with Hayley throughout the night and that she would sleep through the day while her parents stayed with Hayley.

20. This concern, clearly genuinely felt, is slightly at odds with the medical records. Over this period they suggest that Hayley's status improved. She started to take bottle feeds and was beginning to eat a little as well as gaining weight.

21. However, she did develop a wound infection and on 6 November she was started on intravenous antibiotics and her oxygen requirements started increasing. Her mother vividly describes an increase in the work of breathing with head bobbing as well as relating that the wound infection was not healing and required surgical drainage.

22. On 7 November Hayley was clearly retaining fluid and her weight had gone up some 500g. She is described as lethargic. By 9 November the family's concerns are clearly very substantial. However, the doctors do not appear as concerned and it seems that it took some pressure from the family to arrange a chest X-ray at this time.

23. This showed collapse of the right upper lobe and it is noted that her wound was still bad at that stage and required a second debridement. Physiotherapy was planned but did not occur over the course of that night.

24. Over the night of 9 to 10 November Hayley became increasingly unwell. She vomited once and her breathing became worse, as a result of which a further chest X-ray was undertaken. This showed collapse of her right lung and she was put into head-box oxygen.

25. Despite concerns she was not moved to HDU and it is clear that the possibility of H1N1 (swine flu) was raised by the staff around this time. In view of those concerns Hayley was put into isolation and physiotherapy was not undertaken.

26. Over the course of 10 November Hayley continued to be unwell with breathing difficulty. Her medical notes, at that stage, suggested that the clinical status was stable but at 7.00 on the morning of 11 November she

deteriorated further and by 7.30am she clearly took a major turn for the worse.

27. She was reviewed by the medical staff and intubated but had a cardiac arrest shortly before 8.00am and her resuscitation was unsuccessful.

28. I note that the Trust conducted an investigation into Hayley's death and have acknowledged a number of failures. This includes failure to recognise that Hayley had an increasing need for oxygen even though she was some three weeks post surgery. They also comment on Hayley's collapsed lung on 9 November and misunderstanding of the admission criteria to PICU.

Comments

29. There are several comments I would make about the care that Hayley received, and then will set out a number of areas of specific concern that I feel need to be addressed.

30. Hayley's parents have written a very clear record of their experiences which is harrowing at several points. It documents major concerns that they had, and raised, with the care Hayley was receiving. It concerned them enough to make complicated arrangements for staying with Hayley, and for bringing family in to help support.

31. However the medical and nursing notes, which are fairly sparse in places, do not seem to reflect the same level of anxiety about her health. This suggests that either the family were inappropriately anxious about Hayley when she was in fact fairly well, or that staff on the ward had not recognised what the family knew, which was that Hayley was in fact in real trouble with her breathing.

32. This disparity would usually be very difficult to resolve, but there are 2 factors in this case which both support the family's view of events. The first, of course, is Hayley's tragic death. The second, however, is found in the language used in the statements that the family gave describing Hayley over the days prior to her death.

33. The expressions within those statements, such as 'her head was ... bobbing', and 'all she wanted to do was sleep' are clear descriptions of a child in respiratory difficulty, but not ones that the family would necessarily know about as they are not medical.

34. My second comment is about the importance of early recognition of respiratory difficulties. Within intensive care, all staff are (or should be) aware that children can deteriorate very quickly. This 'decompensation' is well described in resuscitation courses (such as EPLS or APLS) and has clear physiological causes.

35. When problems occur with fundamental processes like breathing, the patient will compensate for as long as they possibly can. Thus despite real breathing problems, blood gas results, blood pressure and other measurements can remain normal until a critical moment when the body can no longer support them.

36. In severe respiratory illness this point is often when the muscles 'fatigue' and no longer have the cellular energy (ATP) to continue contracting. Collapse from this point is very rapid, and cardiac arrest can occur swiftly afterwards.

37. Resuscitation courses emphasise throughout their training that recognition of signs of imminent collapse should be watched for, so that intervention can occur *before* decompensation, and with a far greater chance of avoiding disaster.

38. In this case that collapse occurred, and clear warning signs of respiratory difficulty seem to have been missed or ignored.

39. This brings me on to my last point, which is the apparent failure of the staff to communicate between themselves at different levels. Within this history there appears to be clear evidence that the nursing and medical staff took inadequate notice of genuine and appropriate concerns that were being raised by the family.

40. Furthermore, there seems to have been a willingness to place Hayley in a position on the ward where she was being cared for by nurses who did not have the experience to recognise the development of serious illness, and who were also not enabled to obtain senior advice and support when it was desperately needed.

41. This raises genuine concerns about the hierarchy of care in the hospital and how communication between members of the care team (including the parents) was being blocked.

42. Within these general comments I also have a number of specific areas that I feel should be addressed in any review of this case.

    a. The admission criteria between the wards and PICU seem to be unclear. It would be helpful to know whether clear recommendations for PICU review or admission have been developed. In Hayley's case, the failure to understand the admission threshold for PICU, and to have a clear mechanism for invoking that transfer, may have contributed significantly to her deterioration and death.

    b. In the same vein, communication between PICU, HDU and ward staff needs to be reviewed. Had Hayley been reviewed at an earlier stage by an experienced doctor (or nurse) from PICU, it is likely that the seriousness of her respiratory condition would have been recognised earlier and definitive care started sooner. Trusting her care to staff who were too inexperienced to recognise the severity of her condition, or too scared to call for senior help, was inappropriate.

    c. Hayley had a number of abnormal x-rays whilst in the PICU prior to her original discharge. No follow up of these changes, or reflection as to their significance in her symptoms whilst on the ward, appears to have been made.

d. There do not appear to have been adequate chartings of the PEWS score for Hayley. When PEWS scores were elevated, there does not appear to have been escalation of care or review as should have happened. Information from the hospital about the scoring system, and the policy that should be followed for an elevated score is not available. However it is clear that markers of serious respiratory compromise were ignored.

e. Recommendations for physiotherapy, which may have helped Hayley clear secretions or mucous plugs, were not carried out promptly. It is not clear whether Hayley's isolation may have delayed this support, but in the situation that pertained at the time, physio might have been a very valuable assistance to Hayley's breathing.

f. The response of the hospital when swine flu was considered appears to have been damaging to Hayley's overall care. There was immediate isolation, yet the testing was not conducted for several hours afterwards, and no facility for getting the test done on site was available. This reaction (of isolating Hayley) may have had a significant impact on the level of nursing care and medical review (as well as physio support) that Hayley received over the course of that day.

Statement of duty to the Court

43. I understand that my overriding duty is to the court, both in preparing reports and giving oral evidence.

44. I have set out in the report what I understand from those instructing me to be the questions in respect of which my opinion as an expert are required.

45. I have done my best in preparing this report to be accurate and complete. I have mentioned all matters which I regard as relevant to the opinions I have

expressed. All the matters on which I have expressed an opinion lie within my field of expertise.

46. I have drawn to the attention of the court all matters of which I am aware might adversely affect my opinion.

47. Wherever I have no personal knowledge, I have indicated the source of the factual information.

48. I have not included anything in this report which has been suggested to me by anyone, including the lawyers instructing me, without forming my own independent view of the matter.

49. Where, in my view, there is a range of reasonable opinion, I have indicated the range of that opinion in this report.

50. At the time of signing this report I consider it to be complete and accurate. I will notify those instructing me if, for any reason, I subsequently consider that this report requires any correction or qualification.

51. I understand that this report will be the evidence I give under oath, subject to any correction or qualification I may make before swearing to its veracity.

52. I have included in this report a summary of my instructions.

53. I confirm that insofar as the facts stated within my report are within my knowledge I have made clear which they are and believe them to be true, and that the opinions I have expressed represent my true and complete professional opinion.