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INVESTOR IN PEOPLE

Mr. A Wilson
Assistant Coroner for the City of Liverpool
St. George's Hall
St. George's Place
Liverpool
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Dear Mr. Wilson,

Re: Isabella Hope Hill
Report to Prevent Future Deaths

Further to the Inquest into the death of Baby Isabella Hope Hill which commenced on 27th July and concluded on 11th October 2013. I give below, my response to your request pursuant to Paragraph 7 of Schedule 5 of the Coroners and Justice Act 2009 and Regulations 28 and 29 of the Coroners (Investigations) Regulations 2013. My response identifies the actions we have taken to prevent future deaths and, where possible, I have included our timescales for implementation of those changes.

Background

Isabella Hope Hill was born on 10th July 2013 at 26 weeks gestation. She was admitted to the Trust's Neonatal Intensive Care Unit (NICU) due to her prematurity. As part of her treatment and care, Isabella had an umbilical venous catheter (UVC) inserted through which she received her nutrition and other required intravenous fluids; blood products and medication. The UVC was inserted and then withdrawn by 1 cm following review of her abdominal x-ray. According to the Unit's Guidelines, Isabella should have been re-x-rayed after the UVC was re-positioned as the tip of the UVC had originally been located in her heart. At 18:00 hours on 10th July 2013, during the medical staff handover, it was noted, when reviewing her earlier x-ray, that the UVC was still positioned too high despite being withdrawn by 1cm. It was noted that there should be a repeat x-ray the following morning. This x-ray was not, however, performed on 11th July 2013.

Isabella initially remained well until she started to show signs of deterioration on 12th July with bradycardias (slowing down of her heart rate) and desaturations (a drop in the oxygen levels in her blood). On the afternoon of 13th July it was noted that her oxygen requirements were increasing, she was having a number of desaturations and, that the bradycardias now required intervention. She subsequently required ventilation at 18:00 hours on 13th July 2013. Post intubation, her abdomen was noted to be shiny and distended but soft. Her feeds were therefore stopped as a precaution. An x-ray of her abdomen was taken at 18:41 hours was taken and a provisional diagnosis of necrotising enterocolitis was made. The on-call consultant neonatologist was contacted at approximately 19:00 hours home and she was commenced on antibiotics. He was contacted again at approximately 23:00 hours and up-dated about her worsening abdominal distension. He advised that, as a precaution, Isabella be treated conservatively and metronidazole an additional antibiotic was added to her treatment regime.

In the early hours of 14th July, it was noted that Isabella's abdomen was looking more distended and a repeat abdominal x-ray was performed. Her blood gases remained unsatisfactory requiring correction and at 02:45 hours on 14th July 2013, Isabella had a sudden collapse requiring cardiac massage and re-intubation. The On-call consultant neonatologist was called in from home and he arrived at 03:15 hours. He reviewed the earlier x-ray and noted that the UVC was mal-positioned. All fluids were therefore stopped and an abdominal tap was performed which drained approximately 30 mls of intravenous nutritional fluids. An abdominal drain was inserted. Following this procedure, her distended abdomen; saturations; heart rate and colour were visibly improved and it was possible to reduce her level of ventilation. The Consultant commenced an Adverse Clinical Event Investigation. Although Isabella's condition improved, she remained poorly but stable throughout 16th July 2013. Sadly, however, on the morning of 17th July, Isabella had an acute deterioration that required aggressive resuscitation. This resulted in her heart rate and saturations improving and her condition stabilised for approximately 20 -30 minutes after which she had a further collapse. ████████ were involved in the decision to cease resuscitation and Isabella was certified dead at 10:35 hours on 17th July 2013. HM Coroner for the City of Liverpool and the Liverpool Clinical Commissioning Group were notified of the death.

The previously commenced Adverse Clinical Event investigation was escalated to a Serious Incident Investigation and a multidisciplinary panel met to review the death on two separate occasions. The Review Panel concluded that the root cause of Isabella's death was the inadvertent infusion of fluid into her peritoneal cavity.

An Action Plan was generated following the Trust's Serious Incident Review process and has been populated by recommendations and learning points from the Review. The Action Plan is being progressed by the neonatal Clinical Governance and Risk Leads and progress will be monitored by the Neonatal Executive Board, the Trust Board and by Liverpool Clinical Commissioning group until all actions have been completed. All actions have a designated lead and timeframes for completion.

The investigation highlighted the following areas where changes were required to prevent future similar incidents:

What we identified: and what we have done to implement necessary changes:

1. There was a lack of awareness of line position and the need to remove the UVC on 13th July at 18.49 hours. There was also a failure to recognise the significance of an unexpected clinical deterioration with abdominal distension in a baby with a central venous catheter in-situ.

   What we have done to implement necessary changes:

   a) A review of the method of fixing UVCs and documentation regarding line positioning commenced in November 2013 to consider whether a more secure way could be identified to prevent migration of UVCs. Practice comparisons with other level 3 neonatal units and literature searches have confirmed LWH's practice to be consistent with practice in other neonatal units.
   b) The neonatal guideline in respect of UVCs was revised immediately and now includes the following statement: *'Any sudden or unexpected deterioration in a baby with a central venous catheter in-situ should always prompt an urgent assessment of the position of the catheter tip. Serious complications such as pericardial effusion/cardiac tamponade or infusion of fluid into the pleural or peritoneal cavities should be excluded by x-ray or ultrasound.'* The revised guideline was re-launched with the new cohort of junior medical trainees who commenced their placement in August 2013.
   c) Further guideline work is planned to include the potential consequences of using a central venous catheter that is not in an optimal position.
   d) Details of possible complications of misplaced UVCs and learning points from this case were disseminated to staff during August, September, October and November 2013 as follows:
      i. The Neonatal Great Day (an internal day of information sharing for neonatal staff);
      ii. Mandatory multidisciplinary educational sessions;
      iii. Lesson of the Week which is disseminated to all medical and nursing staff at the beginning of all medical and nursing staff shift changes;
      iv. This case was included in the August medical staff induction programme and will be incorporated into all future medical staff inductions;
      v. Learning points are frequently reiterated at weekly staff Risk Huddles;
      vi. Lessons learned were discussed at the Cheshire and Mersey Neonatal Network Meeting on 2nd December 2013 and will be shared at the next British Association of Perinatal Medicine meeting on 31st January 2014.

   e) A prospective audit around compliance against revised guideline is in progress;
   f) Individual feedback to all staff involved in the event has taken place and where necessary the educational

supervisors of individual trainees have been informed of the event and their trainees involvement.

2 We did not communicate the need for, or perform an x-ray on 10th July 2013 after repositioning the 2nd UVC:

What we have done to implement necessary changes:

a) This issue has been addressed through enhanced local education for staff on the Neonatal Unit in respect of the content of the revised guideline;
b) The current Service Level Agreement (SLA) for Radiology with an external provider has been reviewed and clarified and now confirms that all required x-rays on neonatal patients will be performed within 60 minutes of receipt of a request, 24hrs per day and 7 days per week.

3 Medical Staff did not routinely complete the Task List on the electronic patient administration system (Badger)

What we have done to implement necessary changes:

a) The Medical Staff Task List on the electronic patient administration system (Badger) was not being used widely by all grades of medical staff or Advanced Neonatal Nurse Practitioners and additional education sessions and Lessons of the Week are planned to raise awareness and increase its use at handover times.

I attach a copy of the Final Serious Incident Investigation Report and up-dated action plan for your attention.

Please do not hesitate to contact me for clarification of any of the issues raised above or if you require any further information.

Yours sincerely

Kathryn Thomson
Chief Executive