

into the heart during that heart between when the x-ray was taken showing the initial position and when it was reviewed following which [Child A] shortly deteriorated. Dr H confirmed that it would be very unlikely that the line would have migrated however because of this possibly being an issue it decided it was safest to remove the line. He confirmed there had been no evidence of arrhythmia and therefore there was no evidence to suggest that the line had migrated at all and was causing any problems however he decided that if he removed the line he would remove the stimulation of any problems. There was a cardiac trace on [Child A] at the time and there was no change in speed, change in complexes and no alarm going off which is generally what would happen if there had been cardiac changes which would suggest an arrhythmia because of line migration. He also confirmed that you would expect to see these changes when the line was initially inserted if the line had been in the wrong place. SKF then asked Dr H whether or not [Child A] had been a particularly wriggly baby or moving around a lot and whether or not this could have caused the line to move. Dr H confirmed that the line had been made secure and [Child A] was not in any obvious distress and was not moving particularly. He confirmed that babies are given a small dose of sucrose as a bit of a painkiller but there was no difficulty in terms of the line.

SKF's final question was whether or not the line could potentially have impacted the wall of the SVC from looking at the x-ray. Dr Harkness confirmed that he did not think this was likely, because the line is flushed to ensure that it is in the middle of the vessel, there was normal flow in [Child A's] case and blood was seen and therefore everything appeared normal in this situation, there was nothing to suggest that the line had impacted the SVC and therefore the vessels could not flow properly. SKF confirmed that she had no further questions and LB confirmed he did not have any questions.

Mr Rheinberg then moved on to questioning Dr Wood. He confirmed that he was present at the handover and then went to the neonatal unit with Dr Harkness. He could not remember whether they went to [Child A] first. He confirmed that given his inexperience in paediatrics he was not able to do lines but was assisting Dr Harkness as he did the procedures. He confirmed that there were no particular complications that he could recall and he imagines that they probably finished around 6.45 pm. Mr Rheinberg then asked whether or not he would go with Dr Harkness rather than stay with [Child A]. Dr Wood confirmed yes, he would and when [Child A] deteriorated he was actually in a different room with a different baby at that time. Mr Rheinberg then asked whether Dr Wood had been present when the x-ray had been reviewed. Dr Wood confirmed that he had been aware of the x-ray and had been told of what it contained. When he first became involved in [Child A's] deterioration, he was shouted over by other members of staff because [Child A's] deterioration had been noted. The main issue at that point was to be able to get into the cot and he assisted with this and he also helped with respirations. He very quickly then moved on to scribing the events and this was to ensure that an accurate log of time was made to ensure that meds were given at the right time. There were then no further questions for Dr Wood.

Mr Rheinberg then moved on to questioning Dr Jayarum (Dr Jay). He confirmed that he was handed over to from Dr Saladi. [Child A] was very stable when he came on shift and he knew about the need for gaining central access. He remembers that Dr Ogden came to him after the insertion of the first UVC line and that the x-ray showed this had deviated and it looked to be in the portal vessel. He confirmed that it would need to be replaced and again the second x-ray showed that the same thing happened and that the line had deviated. They decided that this would need to be removed and a long line would need to be inserted instead for subcutaneous feeds. He confirmed that there was no way of doing this under imaging guidance and it would be fair to say that it is a very hit and miss procedure. He confirmed that you can work out how far the line needs to go in with a formula but all these procedures are blind. He confirmed that the insertion of the long line is slightly less difficult because if you are going in through the inside of the elbow you generally go up and then into the subclavian vein. It is possible that you might go into a smaller vessel but usually if you can flush the vein it will be a big one and therefore you will be in the right place.

Mr Rheinberg then asked whether there was any other way that you could get access other than doing these procedures. Dr Jay confirmed that the only other way would be to administer a 10% solution of dextrose to the baby without a line but this can only be done for a few days as the baby is not getting everything by way of nutrients that he would need. In

known to cause any particular problems. He believes that theoretically it could cause some problem with the blood flow but again there is nothing to suggest that this happened in [Child A's] case.

Mr Rheinberg then asked Dr S whether the dextrose solution going through the long line could have caused some problems but Dr S does not think this would be the case. Mr Rheinberg then asked if he could confirm whether there were any other abnormalities in any of the other systems and Dr S confirmed that everything else was normal. He confirmed that there had been no signs of infection or sepsis and all tests were also negative for viruses. He also confirmed that the toxicology was fine and the only substance identified was caffeine which could be attributed to the caffeine dose which was given as [Child A]. Was a premature baby.

Dr S confirmed that there have been cases of respiratory arrest followed by cardiac arrest where an air embolism would be present and normally one would see froth when the heart was opened up where the blood had mixed with oxygen however this had not happened in this case and there was also nothing in the brain to suggest any particular problems. Mr Rheinberg asked whether there was anything else that Dr S would have considered that he thinks Dr Jay had not considered when he was considering the potential issues in [Child A's] deterioration and Dr S confirmed that there is nothing else that he could have thought of.

Mr Rheinberg then asked Dr S whether he would be able to reach any kind of conclusion by eliminating other causes of death. Dr S confirmed that he would not really be able to do this as he would simply be hypothesising. Mr Rheinberg said whether Dr S had ever seen anything equivalent to this in the literature. Dr S confirmed he has not seen anything like this in the literature but these sorts of things can happen in premature neonates because of the circumstances in which they are born.

Mr Rheinberg then asked Dr S whether or not he could say that it was more likely than not that [Child A] had died of natural causes. Dr S said that they had not found anything to suggest a natural disease but then there was no evidence that there had been anything unnatural either and it would be very difficult for him to conclude that it was more likely than not natural causes because there is no evidence of it either way. He confirmed that there are other tests that can be run such as those for genetics, however there was nothing in this case to suggest that this would be necessary.

Dr Jay was then brought in to try and assist with his paediatric knowledge of the circumstances in Dr S concluding with any kind of cause of death. Mr Rheinberg asked Dr Jay whether or not he had seen anything similar. Dr Jay confirmed that normally death in neonates is the end point in a course of events and normally they can be resuscitated. He confirmed that there have been similar cases of neonates dying in similar circumstances on the unit which they have not been able to explain. He confirmed that they have therefore downgraded the unit so that do not care currently for preterm babies and they have also requested an independent review and they are still awaiting the formal report. However the initial feedback from this is that nothing can be found that is wrong with any of the training, any of the practises or any of the equipment. However there is a potential issue with staffing. As far as Dr Jay is aware this report is then to go back to the Executive Board and they decide whether or not to release it to the public. Mr Rheinberg asked whether or not it would be possible for the family to receive a copy. Dr Jay said he is of the personal view that it should be made available for the public and he would have no issue with a copy of it being provided to the family, however as he pointed out it is the Executive Board's decision. He has to confirm however that the events that happened to [Child A] do not make any clinical sense to him at all. In relation to the cardiac conductivity, Mr Rheinberg asked whether any issues would have shown up on the monitoring. Dr Jay confirmed that this would have been the case. He said it is possible that you can have a rhythm staying the same but the heart not pumping. Mr Rheinberg then asked LB whether he had any further questions for Dr S and he confirmed that he did not. Mr Rheinberg then moved to SKF asking if she had further questions. SKF asked about the microscopic findings that he had identified from the heart and the lungs. She wanted to know whether any of these that he had identified could have been caused by any particular thing occurring to [Child A]. Dr S confirmed that there had been a very small amount of amniotic fluid aspiration. He confirmed that normally in the uterus fluid does not go in through the baby's mouth however in stress this can make the baby gasp and therefore inhale an element of amniotic fluid. He confirmed that it is fairly common to see,