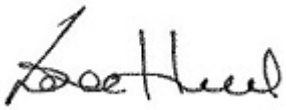
	REGULATION 28 REPORT TO PREVENT FUTURE DEATHS **THIS REPORT IS BEING SENT TO:** 1. Birmingham Women's and Children's NHS Foundation Trust 2. Department of Health & Social Care
1	**CORONER** I am Louise Hunt, Senior Coroner for Birmingham and Solihull
2	**CORONER'S LEGAL POWERS** I make this report under paragraph 7, Schedule 5, of the Coroners and Justice Act 2009 and regulations 28 and 29 of the Coroners (Investigations) Regulations 2013.
3	**INVESTIGATION and INQUEST** On 23 May 2024 I commenced an investigation into the death of Aarav Pal CHOPRA. The investigation concluded at the end of the inquest. The conclusion of the inquest was: Aarav died from the consequences of a cardiac arrest caused by severe bleeding following damage to an intercostal artery during a liver biopsy which went undiagnosed and untreated at the time of the procedure. His death was contributed to by poor planning before the procedure when there was no consideration of stopping antiplatelet medication, poor written and oral communication about the complication that occurred during the procedure all of which hampered treatment after his collapse. His death was contributed to by neglect.
4	**CIRCUMSTANCES OF THE DEATH** Aarav was born with biliary atresia which meant the bile flow out of his liver was blocked. Due to this a Kasai portoenterostomy was undertaken on 26/10/20 to bypass the blockage and ensure the bile drained into the intestine. In February 2023 he presented with fever and worsening jaundice and was treated as an inpatient for cholangitis and worsening liver failure. He was placed on the transplant list in April 2023 and received a transplant on 15/08/23. Post transplant he developed hepatic artery thrombosis, which is a recognised complication of liver transplant, requiring further surgery to reconstruct the blood flow for the liver and bile ducts. The bile ducts were found to have been damaged by this complication. He was placed on dual antiplatelet therapy to try to avoid any further similar complications. The effect of antiplatelet medication is to impede the ability of the blood to clot effectively. Aarav went on to develop rejection of the graft liver and was found to have severe stenosis of the reconstructed bile ducts and had drains inserted. The rejection was treated, and he was able to go home on 23/10/23 on immunosuppressant medication to return for further tests a short time later. He was admitted on 20/11/23 for those further tests which included a percutaneous transhepatic cholangiogram (PTC), a liver biopsy and removal of a vas catheter line which were all undertaken on 21/11/23. Prior to the procedure no consideration was given to stopping his dual antiplatelet therapy which should have been stopped a week before and the clinicians involved in the procedure were unaware he was on antiplatelet medication. The PTC proceeded without problem. The first attempt at the liver biopsy was undertaken by a trainee who placed a coaxial needle into the 7th intercostal space. The needle could not be seen on imaging and was withdrawn. It was not appreciated at the time that the needle did not follow the correct pathway which damaged an intercostal artery which started to bleed. A second attempt was made in the 8th intercostal space, and a liver biopsy was obtained. A vas catheter was removed. A fluoroscopy undertaken at the end of the procedure at 12.10 identified blood in the pleural space (haemothorax) but this was not identified as significant at the time and was not treated or communicated to other staff caring for Aarav. The operation record did not record that 2 attempts were made to obtain a liver biopsy nor that there were any concerns about a haemothorax. In

	recovery Aarav was agitated and 2 out of 4 blood pressures could not be recorded. He returned to the ward at 12.50 after 20 minutes in recovery and only 1 blood pressure could be recorded at 13.15 which was low and at the same time he had a high heart rate. Aarav continued to be agitated and cold and it was not appreciated that he needed further review. Aarav went into cardiac arrest at 13.30 and received resuscitation for 28 minutes before being moved to PICU for stabilisation. An US at 14.00 confirmed a large haemothorax however a chest drain was not inserted at this time. There was no joined up discussion about how to best treat Aarav and it was unclear who was leading decision making for the complication that had occurred. Aarav was taken back to the interventional radiology theatre at around 16.30/17.00 where they identified a puncture of the intercostal artery which was embolised and a chest drain was inserted. On return to PICU it was confirmed that sadly Aarav had suffered a hypoxic brain injury during the prolonged arrest and he passed away on 22/11/23. Had the haemothorax been addressed at the time of the procedure Aarav would likely have been monitored and treated before the cardiac arrest. Following a post mortem, the medical cause of death was determined to be: 1a Hypoxic ischaemic encephalopathy 1b Significant bleeding into the pleural space with pressure on the heart 1c Damage to the intercostal artery during liver biopsy 1d II Liver transplant due to biliary atresia
5	**CORONER'S CONCERNS** During the course of the inquest the evidence revealed matters giving rise to concern. In my opinion there is a risk that future deaths will occur unless action is taken. In the circumstances it is my statutory duty to report to you. The **MATTERS OF CONCERN** are as follows. – 1. **Prophylactic antibiotics for severely immunocompromised patients**: The inquest heard evidence that patients like Aarav who are immunocompromised require additional prophylactic antibiotics for procedures. This is not covered in the current NICE guidelines. My concern is that there is currently no guidance for the use of prophylactic antibiotics in severely immunocompromised patients. 2. **Experience and competence of trainees**: The inquest heard evidence that there was confusion around the experience and level of the trainee involved. He was thought to be an ST6 when he was an ST4. My concern is that there is no mechanism to evidence trainees experience and competence when they travel to various different hospital trusts as part of their training. 3. **Consent forms**: The parents of Aarav were unaware that a trainee would be doing the liver biopsy. My concern is that there is currently no way to obtain consent when a trainee will be doing the procedure. 4. **Individual patient risk factors**: Aarav had a complex medical background and several risk factors for any procedure. My concern is that there is currently no mechanism to identify individual patient's risk factors so that all clinicians involved in their care are aware. 5. **Learning from deaths:** The initial M&M meeting after Aarav's death was described as inadequate. My concern is that there was no immediate learning from this tragedy and further consideration is needed to ensure a safe and effective mechanism to properly learn from deaths at the earliest opportunity. 6. **Electronic patient records:** I heard evidence that the lack of electric medical records meant clinicians found it difficult to see all of the patient's medication details. My concern is that critical information can be missed if clinicians do not have access to all the clinical records when planning treatment.

6	**ACTION SHOULD BE TAKEN** In my opinion action should be taken to prevent future deaths and I believe you have the power to take such action.
7	**YOUR RESPONSE** You are under a duty to respond to this report within 56 days of the date of this report, namely by 10 March 2025. I, the coroner, may extend the period. Your response must contain details of action taken or proposed to be taken, setting out the timetable for action. Otherwise you must explain why no action is proposed.
8	**COPIES and PUBLICATION** I have sent a copy of my report to the Chief Coroner and to the following Interested Persons: Aarav's parents and to the LOCAL SAFEGUARDING BOARD. I have also sent it to the Medical Examiner, ICS, NHS England, CQC, who may find it useful or of interest. I am also under a duty to send the Chief Coroner a copy of your response. The Chief Coroner may publish either or both in a complete or redacted or summary form. He may send a copy of this report to any person who he believes may find it useful or of interest. You may make representations to me, the coroner, at the time of your response, about the release or the publication of your response by the Chief Coroner.
9	**13 January 2025** Signature:  **Louise Hunt** **Senior Coroner for Birmingham and Solihull**