	REGULATION 28 REPORT TO PREVENT FUTURE DEATHS **THIS REPORT IS BEING SENT TO:** **1. Chesterfield Royal Hospital NHS Foundation Trust**
1	**CORONER** I am Sophie Cartwright Assistant Coroner, for the Coroner area of Derbyshire.
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 8.4.14 an investigation into the death of Ann Catherine Jacobs aged 50 commenced. The investigation concluded at the end of the inquest on 16.3.16. The conclusion of the inquest was a Narrative Conclusion with a medical cause of death of: 1a Cardiac arrest 1b Malignant Ventricular arrhythmia 1c Hypokalaemia 2. Alcohol related liver disease. Narrative Conclusion: At approximately 23.00 on 23.2.14 Ann Jacobs presented at the Emergency Department of Chesterfield Royal Hospital with a Gastro Intestinal bleed. An ECG undertaken at 23.06 on 23.2.14 showed marked prolongation of the QT interval. A blood test result at 00.51 on 24.2.14 showed severe hypokalaemia with a potassium level of 2.4 mmol. Severe hypokalaemia was diagnosed and intravenous potassium replacement commenced at 05.45 on 24.2.14 administered by 40 mmol potassium chloride in a litre of dextrose saline over 8 hours to treat the severe hypokalaemia. Oral potassium supplementation of 24 mmol was also given both at 18.32 and 23.05 on 24.2.14.

	A further blood sample reading at 06.38 on 24.2.14 showed a potassium level of 2.7 mmol. There was no further blood test taken after this time. There was no monitoring of the potassium level every 8 hours after commencing the intravenous potassium as indicated by the hospital guidance for the management of acute hypokalaemia. The absence of monitoring of the potassium level as indicated every 8 hours for severe hypokalaemia more than minimally contributed to the death.
4	**CIRCUMSTANCES OF THE DEATH** The summary circumstances can be ascertained from the narrative conclusion. The last check by blood test of the potassium level was at 06.38 on 24.2.14. I heard evidence from both [redacted] the expert witness and [redacted] of Chesterfield Royal Hospital that a further blood test should have been taken around 2pm in accordance with the Trusts guidance on the management of acute hypokalaemia so that an accurate potassium reading was known to inform the further management and treatment. [redacted] gave evidence that on the balance of probability a further I/V infusion of potassium would significantly have reduced the arrhythmic risk. [redacted] evidence also covered that Ann Jacobs had had only 88mmol of potassium during 24.2.14 and that WHO guideline recommends a daily potassium intake of at least 90 mmol for adults. I also heard evidence from [redacted] that when Ann Jacobs was transferred from the Emergency Management Unit to her ward on the evening of 24th February 2014 [around 8pm] there was no instruction given in respect of monitoring Ann Jacobs potassium levels. At approximately 3.00am on 25.2.14 Ann Catherine Jacobs was found unresponsive, with no pulse and in asystole whilst in bed on the Ridgeway ward of Chesterfield Royal Hospital. She had been last checked and seen alive by nursing staff at 1am on 25.2.14. Resuscitation attempts and cardio pulmonary resuscitation were commenced but Ann Jacobs remained in asystole and life was formally pronounced extinct at 07.55.
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 could 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) That when a diagnosis of severe hypokalaemia is made in patients that there is the monitoring of potassium levels every 8 hours and adherence to the Trust Management of acute hypokalaemia guidance. This is particularly important as the guidance itself makes clear "ECG changes can occur at any level of hypokalaemia. Hypokalaemia can result in flat T waves, ST depression, QT interval prolongation and prominent U waves. Ventricular arrhythmias (eg torsades de pointes, ventricular tachycardia and ventricular fibrillation) can also occur. It is of concern that this monitoring did not take place during the last admission of Ann Jacobs and by way of treatment for her identified severe hypokalaemia.
6	**ACTION SHOULD BE TAKEN** In my opinion action should be taken to prevent future deaths and I believe Chesterfield Royal Hospital NHS Foundation Trust 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 16.5.16. 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 [redacted] 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	**19th March 2016** **Sophie Cartwright**