OFFICE OF THE CHIEF MEDICAL OFFICER

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[redacted]

30 March 2021

Sonia Hayes
Assistant Coroner
Mid Kent and Medway Coroners
Cantium House
County Hall
Sandling Road
Maidstone
Kent
ME14 1XD

Dear Ms Hayes,

Prevention of Future Deaths Regulation 28 Report – Luke Jackson

We refer to your report issued following the inquest touching upon the death of Luke Jackson dated 24 February 2021 pursuant to Regulation 28 of the Coroner's (Investigations) Regulations 2013.

(1) Luke had complex needs and was awaiting results of genetic testing relating to Becker's Muscular Dystrophy. He had not been eating and drinking and had loose stools and vomiting that had progressed over a five-day period on a background of a chest infection. His parents had sought and followed medical advice from the hospital by telephone. Luke continued to deteriorate, and he was admitted. The Trust took some steps on admission to address his low potassium.

(2) Evidence was heard from a Consultant from the Evelina Children's Hospital that many children among their 2000 referrals each year have diarrhoea and vomiting as a first symptom. Metabolic derangement in a child with myopathy may be associated with total body potassium depletion: children with myopathies have a low muscle mass that compromises their ability to correct their own potassium levels when unwell. This is often not well recognised by treating clinicians. Treatment for this condition may need to be undertaken in intensive care due to the increased amounts of potassium required to correct the derangement and manage clinical risks.

(3) Luke had a chest infection, however his low potassium made him weaker and as it progressed, he was shunting blood away from his gut to compensate (this assists to protect vital organs such as the heart and brain) which resulted in loose stools and vomiting that were not a consequence of gastroenteritis. One of the early symptoms of this shunting process is a high heart rate. In addition, development of a chest infection requires a child to breath harder and this is

more difficult in a child with myopathies who is already weakened due to low potassium and who may as a result not present with the usual symptoms of respiratory distress.

The following is our response in relation to the matters of concerns raised:

The Trust has updated their Paediatric Guidelines (GUDPCM016) in response to patients with myopathies to reflect that:

- All doctors must be aware that…
    - These patients are likely to have a low muscle mass and that a low serum potassium may indicate underlying deficit in total body potassium
    - Chest infection can lead to blood redistribution from the gut (leading to diarrhoea and vomiting) and so mimic gastroenteritis
    - Respiratory compromise may not show by typical symptoms and signs.

- These patients must be fully assessed by a Registrar or above (in common with oncology patients) before discharge.

- These patients must have a low threshold for admission to HDU with full cardiac monitoring, saturation monitoring and potassium replacement. All children admitted to HDU are now discussed with the South Thames Retrieval Service (STRS) as a matter of course.

The Trust has also updated their Paediatric Guidelines with regards to the indications for contacting the STRS in children with hypokalemia and contacting STRS. Our STRS link, Dr [redacted] who has agreed that STRS do not expect to be contacted for all children with a serum K < 3.0. The use of dilute peripheral solution for potassium remains safe and first line option in District General Hospital settings in appropriately chosen patients.

Yours sincerely,

Dr [redacted]
Chief Medical Officer

Appendix 1. Action Plan

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Ref	**Action/Recommendation**	**Outcome for patient when implemented**	**Action Owner:**	**Progress notes:**
1	Ensure abnormal results are recognised and escalated to Consultant.	Improved monitoring enabling better management and care to be delivered.	Paediatric Consultant	Abnormal results, particularly electrolyte abnormalities are highlighted at hand-over. Handover includes abnormal electrolyte results. Consultant oversees handover twice daily on weekdays and once daily over the weekend. Examples of recent awareness – two patients with low potassium and guidelines followed within same shift. Example of awareness – Datix incident forms completed by senior nurse prior to next handover with immediate action taken by medical staff.
2	Develop a guideline for recognition and management of low K+ on the paediatric ward.	Improved monitoring enabling better management and care to be delivered.	Paediatric Consultant	The full algorithm has been prepared and was ratified through clinical governance procedure. Page 94 and 95 of Paediatric Guidelines. Completed and uploaded to QPulse (Trust document management system) in January 2021 and updated March 2021.
3	Amend medical handover sheets to highlight abnormal results in bold	Improved monitoring enabling better management and care to be delivered.	Paediatric Consultant	Junior doctors and nurses are reminded at every handover to highlight abnormal or concerning results. Completed and reviewed twice daily (weekdays) and once daily (weekends) by consultant.
4	Consultant and nurse in charge to ensure structured handover every time.	Improving the quality of handover ensures accurate information including management plans, is conveyed to relevant teams.	Paediatric Consultant/ Matron	This is an on-going practice and will be reinforced to all colleagues. Morning handover (including weekends) is led

				by consultant and nurse in charge (as per rota). Night handover (including weekends) is led by specialty registrar and nurse in charge (as per rota). Weekday evening handover, led by consultant and nurse in charge (weekdays 5pm as per rota).
5	Junior doctors to undergo European paediatric life support training as soon as they start in the Trust.	Earlier recognition leads to better monitoring and management with better outcome.	Paediatric Consultant / Senior Resuscitation Officer / Consultant Anaesthetist & Simulation Lead	To be highlighted at Induction. Participation of Consultants and nurses in Simulation exercises has improved.
6	Awareness and improved accuracy of documentation of input and output.	Enhances recognition and management of dehydration.	Matron	Through Nurse Study days and other training. Awareness of good record keeping written on handover sheet, and reviewed at each handover.
7	**Children with myopathy** a. Ensure awareness of doctors that increased risk of low muscle mass, low total body potassium, chest infection can cause gut blood redistribution, and atypical respiratory symptoms and signs of compromise b. Be fully assessed with a low threshold for admission to High Dependency unit for full cardiac and saturation monitoring, by a Registrar or above, noting higher risk for respiratory	Improved safety for vulnerable group by increased awareness and increased monitoring by senior doctors in team	Paediatric Consultants and Paediatric Registrars	Completed update of Paediatric guidelines (version 6.8) uploaded to QPulse March 2021.

	compromise c. Be assessed for worsening PEWS (observation score) by the Registrar or above d. Managed appropriately based on a-c.			