Introduction
Diabetic Ketoacidosis (DKA) is a life-threatening condition characterised by hyperglycaemia, ketoacidosis and dehydration. Symptoms of Type 1 diabetes are often missed in young children, thus DKA is the presenting feature in up to 25% of under 5s (1). Management of DKA in children is different to that in adults and can be confounded by difficult IV access and unfamiliarity with paediatric guidelines and drug dosing. Complications such as cerebral oedema and electrolyte disturbance are more common in smaller children (2) and make ongoing management more complex. We discuss the case of a 5-year-old with DKA to illustrate these issues.

The Case
A 5 year-old child presented with severe DKA as her first presentation of T1DM. She had experienced general malaise, abdominal pain and vomiting and was now unusually drowsy. On admission, a blood gas showed a pH of 6.8, glucose 13.1, ketones 5.7, HCO3 - 6 and K+ 3.5 mmol/L consistent with severe DKA. Her GCS was 11. She was managed using the 2020 British Society of Paediatric Endocrine and Diabetes (BSPED) DKA guideline (3).

She developed signs of raised ICP and received hypertonic saline, following which her GCS improved. Her acidosis gradually improved, but her K+ fell (fig.2) despite supplementation. That evening she became bradycardic and was found to have a K+ of 1.8 mmol/L. She developed irritable arrhythmias (fig.4) culminating in ventricular fibrillation (VF).

Discussion
This child was admitted with severe DKA and cerebral oedema and developed severe hypokalaemia, despite moderate K+ replacement, suffering a hypokalaemic cardiac arrest. On discussion with her parents, she had a long history of fatigue and is a ‘different more energetic person’ after treatment. It is likely that she developed metabolic disturbance and DKA over a long period, predisposing her to the complications she suffered and demonstrating the difficulty in diagnosis of T1DM in small children. Subclinical cerebral oedema is a relatively common and easily missed complication of paediatric DKA (4). Clinically apparent cerebral oedema affects 1% of admissions but is the most common cause of morbidity and mortality in childhood DKA. Hypokalaemia develops during resuscitation, in all age groups, but is rarely as pronounced, and not as common a focus in paediatric guidelines as it is in adults. Aggressive K+ replacement in children may be unfamiliar to clinicians outside PICU and it is often inadequately replaced. This can result in severe hypokalaemia and the need for central access, anaesthesia and PICU transfer, which is traumatic for the family and costly to the NHS. The 2020 BSPED guidelines provide clear guidance and a calculator to assist in management of DKA but perhaps do not go far enough with regards to hypokalaemia. All children with DKA require paediatric involvement and HDU care, but the need for PICU and interhospital transfer might be avoided by seeking early advice from practitioners familiar with safe methods of aggressive electrolyte replacement.

References
1. Diabetes UK position statement 2015