



# **Independent investigation into the death of Coco Bradford**

## **Appendices**

## Document Information

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<b>Reviewed by:</b>	Darren Thorne, Managing Director

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## Acknowledgements

Facere Melius would like to thank all of those who made themselves available to be interviewed, some on several occasions.

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Aged 1 month to 16 years*

# Appendix 1: Terms of reference

**One + all | we care**

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NHS Trust

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## **Terms of reference for the independent investigation into the death of Coco Bradford**

### **1. Introduction.**

Coco Bradford (aged 6) was admitted to the Emergency Department of the Royal Cornwall Hospitals Trust (RCHT) on 25<sup>th</sup> July 2017 exhibiting a variety of symptoms including blood in stools; excess bowel movements and inability to tolerate fluids.

Coco was discharged home but returned to RCHT and was admitted to HDU on 26<sup>th</sup> July 2017 having developed haematemesis and frank blood in stools. Coco remained in HDU until a decision was taken on 28<sup>th</sup> July 2017 to transfer her to Bristol Children's hospital for renal replacement therapy. Unfortunately, she failed to respond and died there on 31<sup>st</sup> July 2017.

Coco's family have raised questions and expressions of concern around the clinical decision-making processes and treatment afforded to their daughter whilst in the care of RCHT. In consequence of this the Trust's Medical Director has decided there should be an independent investigation into all the circumstances surrounding the death of Coco and has commissioned Facere Melius, a healthcare consultancy, to undertake this investigation by reference to NHS England's Serious Incident Framework published in March 2015 ("the framework").

### **The purpose and scope of the investigation conducted by reference to the framework**

It is important from the outset that all stakeholders involved in the investigation understand its specific purpose and scope. The Trust will seek to secure the co-operation of outside organisations involved in Coco's care and treatment through the period under investigation. The terms of reference will be shared with them.

**Chairman:** Mr Jim McKenna

**Chief Executive:** Ms Kathy Byrne

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Investigations under the framework are designed to support learning and prevent recurrence as follows (page 9 of the framework):

*"Investigations carried out under this Framework are conducted for the purposes of learning to prevent recurrence. They are not inquiries into how the person died, as this is a matter for the coroner. Neither are they conducted to hold any individual or organisation to account. Other processes exist for that purpose including criminal or civil proceedings, disciplinary procedures, employment law and systems of service and professional regulation... In circumstances where the actions of other agencies are required then those agencies must be appropriately informed and relevant protocols outside the scope of this Framework must be followed [NHS England's Serious Incident Framework 2015, appendix 3: Independent Investigation (level 3)]"*

The Trust is committed to ensuring that there is independent scrutiny into the care and treatment that was provided to Coco, in order to ensure lessons are identified and acted upon in a robust, open and transparent manner. The appointment of specialist external investigators is a consequence of this commitment.

## **2. The specific remit of this investigation is:**

- To examine in detail the clinical decision making process at each and every stage of Coco's clinical care and treatment from the point in time she first presented to Royal Cornwall Hospitals Trust (RCHT) on 25 July 2017 (including the decision making process and procedures involved in her eventual transfer to Bristol Children's Hospital on 28 July). This will include any discharge and readmission; if deemed appropriate by the investigation team, any prior GP involvement; NHS Ambulance Service transfer and treatment afforded at Bristol Children's Hospital until Coco's death on 31<sup>st</sup> July 2017.
- To provide a detailed chronology of the events starting from the first indication noted by the parents that all was not well with Coco and that she needed medical attention, through to Coco's death at Bristol Children's Hospital and the commissioning of this independent investigation.
- To consider (and if possible provide answers to) the specific questions asked by Coco's parents in the document attached to these Terms of Reference and marked "CRB".
- Where the investigation identifies any potential areas of concern with regard to the clinical decision making; policies, protocols or procedures applied in the care of Coco by any of the organisations or individuals involved in her treatment between 25.7.17 – 31.7.17, to identify these along with any relevant factors that might have caused or contributed to them.
- To identify areas of good or notable practice.
- To identify any underlying organisational and / or systemic causes so that improvements can be identified for care in the future.

- To review the Trust's compliance with and management of its internal serious incident review processes; its duty of candour and its dealings with/responses to Coco's family from the time of Coco's death until the commissioning of the Independent Investigation.
- To make clear, implementable recommendations for those service providers and individuals who may become involved in the care of any child who presents with serious life challenging conditions such as those suffered by Coco (including specific recommendations in the case of children suffering from Autism or other challenging conditions that impact on communication with any child who presents with communication difficulties) so as to enable the Trust to develop an improvement plan following receipt of the final investigation report based on education of relevant staff and any measures designed to prevent recurrence.

### **3. Methodology:**

The investigation team will use a range of both quantitative and qualitative techniques to undertake the investigation. These will include:

- Obtaining relevant written consents from parents to access Coco's clinical records and any confidential correspondence between them and the Trust; ensuring all relevant witnesses understand the confidential nature of the investigation and have also given consent for the information they supply to be included in the report.
- Establishing that outside organisations have been notified of the investigation; understand the terms of reference and have consented to co-operate; obtain details of nominated officers for contact purposes.
- A review of the medical and clinical records from the Trust and other stakeholders involved in Coco's care including (but not limited to) any relevant documents collated as part of the internal review; correspondence between the Trust and Coco's family. Instruction to relevant medical experts for report on specific clinical issues where the investigation team feels it requires specific clinical expertise.
- Research and review of local policies and procedures; internal protocols and any relevant protocols that apply across the wider locality of health care providers, national best practice policies and guidelines.
- Development of a chronology/ timeline.
- Identification of and pursuing key lines of enquiry.
- Gathering accounts of events through documents; interviews/meetings with key individuals including Coco's family and production of meeting notes as key evidence / reference point against which to report findings and justify recommendations.
- Fact checking and verification of information
- Assimilating the findings /analysis of evidence
- Drafting and finalising a report and recommendations – supported by relevant documentation/witness evidence/clinical documentation
- Quality assurance process, including legal input

## **5. Investigation Team**

- Anil Garcia: Investigating Officer, Associate Facere Melius
- Liz Cosford: Investigating Officer, Associate Facere Melius
- Aleksandra Stasiak, Admin Support, Facere Melius

A team of independent experts will support the investigating officers and comprise:

- Dr Jane Clarke, Consultant Paediatrician and Clinical Director
- Dr Susan Gilby, Medical Director, Consultant in Anaesthesia and Critical Care
- Pippa Roberts, Director of Pharmacy

If further independent expertise is required this will be sourced as appropriate.

Facere Melius Managing Director, Darren Thorne and Delivery Director, Associate, Geraldine Lavery will lead and support the team and oversee the investigation.

## **6. Timescales**

Facere Melius were formally commissioned to undertake the investigation on 16 February 2018. In line with NHS England's Serious Incident Framework (2015) the investigation will be completed within six months of the date it was commissioned.

The framework imposes specific deadlines for the delivery of an independent report under Stage 3 and Facere Melius is committed to deliver within this timeframe. For that reason, the response times in these terms of reference are critical. Facere Melius accepts no liability for any delay in the completion of its report in the event its ability to do so has been caused by lack of co-operation of third parties or failure by the Trust to comply with the above timeframes.

## **7. Communications**

- The Trust will identify an appropriate individual to liaise with and support the family in accordance with the requirements of the framework (liaison officer"); the liaison officer will provide regular communications to the family on the progress of the investigation
- Facere Melius will provide regular updates (fortnightly) to the Trust's nominated officer (Medical Director) on the progress of the investigation
- The Trust will nominate an appropriate individual as the point of contact for the investigation team to respond to information requests, interview arrangements or other logistical arrangements.
- Information requests to the Trust or other stakeholders must be responded to within five working days or if that is not possible the Trust's nominated point of contact for these purposes must inform the investigation team without delay that there are difficulties meeting the deadline and agree alternative arrangements with the investigation team.
- In the event of any difficulties in obtaining information or lack of cooperation in attending interviews will be escalated to the Trust's Medical Director to resolve

- Facere Melius will ensure that requests for interviews with employees of the Trust or other healthcare organisation are provided with no less than five days notice
- The Trust and other stakeholders are required to prioritise releasing their employees from duty so that they can attend relevant meetings with the investigating officers

## **8. Report and closure of the investigation**

On completion of the investigation a draft report will be sent to the Trust who will send it to the relevant stakeholders, including the family involved for factual accuracy checks only. There should not be any amendments to any outcomes or recommendations detailed in the report. Once this is complete the Trust will provide an action plan based on the recommendations and findings. This should take place as soon as possible and within 10 working days.

The Trust should then make arrangements for meeting with relevant key stakeholders to approve the draft report and action plan. Once agreed the Trust will liaise with the legal advisors, investigators, family, Clinical Commissioning Group and other relevant stakeholders to agree closure of the investigation and publication of the final report.

## **9. Next steps**

The Trust will need to agree and set out how it will monitor and progress the recommendations and how it will provide assurance to the family that action has been taken and that lessons have been learnt.

## Appendix 2: The investigating team

### Darren Thorne, Manager Director Facere Melius



Darren is a turnaround and transformation executive consultant who specialises in quality and corporate governance (quality improvement, safety and risk management), strategic planning and sustainability (productivity and financial efficiency) and organisational and system transformation (major change programmes). He supports organisations by providing a range of tools and services including; diagnostic review, assurance of progress, targeted hands-on interventions and full transformation programmes. Adding value with a consultancy approach whilst being a subject matter expert. He actively seeks to develop and empower others through skill and knowledge transfer whilst building and implementing sustainable solutions.

### Geraldine Lavery, Delivery Director, Associate Facere Melius



Geraldine is a Non-Executive Director, Specialist Advisor to the Care Quality Commission and has been an Executive Director of Quality Governance. Geraldine is passionate about the provision of safe, quality care in both the NHS and the care sector. She is experienced in undertaking investigations and supporting organisations to improve in these areas through leadership and management development, implementation of effective governance systems and regulatory compliance. She has worked at both strategic and operational level.

### Dr Gilby, Medical Director University Hospital NHS Trust, North West England



Dr Gilby is an experienced Executive Medical Director. Previously a consultant in Intensive Care Medicine and Anaesthesia, Susan has a track record of delivering quality governance and patient safety improvements in challenged NHS Trusts. Susan is an experienced case manager in investigations and MHPS disciplinary proceedings. Susan has been a member of the NHI national clinical forum since its inception and is the clinical lead for Acute Sustainability in NHS Cheshire and Mersey Partnership

## **Dr Jayne Clarke, Consultant Paediatrician, Associate Medical Director and Clinical Director NHS Trust, Midlands England**



Dr Clarke has been a Consultant Paediatrician since 2008, she is currently Associate Medical Director for Education and Clinical Director for Women and Children's services for an NHS Trust in the Midlands. She has been Clinical Lead for Paediatric Resuscitation and is a Medical Director for European Paediatric Life Support courses run by the Resuscitation Council UK which teach health care professionals how to identify and treat acutely ill and injured children. She sits on the Critically Ill and Critically Injured Children Peer Review Regional Steering Group and has been Lead Reviewer for other hospitals to assess whether they meet the Quality Standards for children's critical care.

## **Anil Garcia, Investigating Officer, Associate Facere Melius**



Anil Garcia is a registered nurse and qualified midwife with extensive investigation experience, project and programme management. Her experience includes working within NHS, Voluntary and Charitable Sector. Areas of expertise include Patient Safety, Quality and Governance.

## **Liz Cosford, Investigating Officer, Associate Facere Melius**



Liz has more than 19 years of experience in governance, risk management project management and business development. Including business planning, performance management, both within the public, private and charitable sector.

## **Sue Morrison, Legal Advisor, Law by Design**



Sue qualified as a solicitor in 1984 having graduated LLB (2.1) with honours from Sheffield University in 1980 and having successfully completed the Solicitors' final examinations at Chester College of Law in 1981.

Throughout her career, Sue has undertaken a broad range of legal work including, in her early career, matrimonial and criminal defence work.

Sue has worked in house as what would now be referred to as "General Legal Counsel" advising on a broad range of public sector specific issues; has undertaken medico legal defence work and since 1992 has specialised in employment law for public and private sector organisations.

## Appendix 3 – Documents reviewed

In total 165 documents were reviewed as part of this investigation, here is a summary:

**Clinical Records** from the following organisations:

- South Western Ambulance Service NHS Trust
- Royal Cornwall Hospital NHS Trust
- Bristol Royal Children Hospital
- Wales and West Acute Transport Service for Children

These included, but are not limited to:

- Recording of 999 Calls
- Medical and nursing records
- Observation charts
- Drug charts
- Early Warning Scores
- Blood results
- BRCH Child Death Review Report and associated documents
- RCHT Paediatric mortality review meeting
- Pain assessments
- Handover documents

### **Patient Information**

- RCHT Gastroenteritis leaflet
- RCHT Diarrhoea & Vomiting leaflet
- BRHC Patient Information

### **Policies, Procedure, Protocols and Guidelines**

- RCHT Incident and Serious Incident policy
- RCHT Being open and Duty of Candour Policy and Procedure
- RCHT Peripheral Intravenous Cannulation in Children Procedure
- RCHT Intravenous Fluid Selection for Previously Well Children Aged One Month to Sixteen Years
- RCHT Policy for the management of patients and staff with diarrhoea
- RCHT Patient and Service User Feedback Policy
- RCHT Disciplinary Policy and Procedure
- RCHT Supporting Staff involved in an accident, complaint or claim
- RCHT Sepsis Clinical Guidance
- RCHT The Big Six Clinical Guideline
- RCHT Patient Observation and Monitoring – Paediatrics and Neonatal Unit
- RCHT Escalation Plan Child Health Sept 2017
- RCHT Guidance for escalation criteria of critically ill children admitted to Child Health

- RCHT Escalation plan child health Nov14
- RCHT Protocol SW Peninsula CDOP July 2016 FINAL
- BRHC Clinical Protocol for Recording and Acting Upon Physiology
- BRHC Fluid Management in Paediatric Patients
- BRHC High Dependency Unit Observation Charts

### **Management Information**

- RCHT Child Health risk management newsletter
- RCHT Operation Pressure Escalation Level
- RCHT Polkerris bed status
- RCHT 72 hour Serious Incident report
- RCHT Serious Incident tracker 1.08.2017
- RCHT Incident Report
- RCHT Child Health risk management newsletter
- RCHT Paediatric Mortality Review Meeting minutes
- RCHT Acute Paediatric Acuity Dependency
- RCHT Annual-report 2014-15
- Learning disability notification of death process
- Safeguarding Children Board annual report

### **Parent Information**

- Parents report of care 25 to 31 July 2018
- Parents report of communication with RCHT

In addition, we had access to internal communications and accounts of events that related to the case.



## Appendix 4: Clinical timeline; 23 July – 28 July

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
<b>23 July 2017</b>				
C1	0802hrs	Onset of Vomiting		Entry in SWAST notes following report from Mother
<b>24 July 2017</b>				
C2		Onset of Diarrhoea		Reported by Mrs Bradford
<b>25 July 2017</b>				
C3	0110hrs	Call to 111	Mr Bradford calls 111. Coco's symptoms are described as Diarrhoea and vomiting with blood in bowel movements and constant rectal bleeding since 1pm	Audio Call
C4	0120hrs	999 call made manually from 111	This was categorised by 111 as Category3	Audio of call
C5	0253hrs	999 call was received from Coco's home	Mr Bradford calls to enquire where the ambulance is, an Emergency Medical Dispatcher (EMD) put the call through to a Clinical Supervisor (CSUP), who triaged and upgraded the call to a Category 2.	Audio of call

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C6	0406hrs	999 call was received from Coco's home	Mr Bradford calls 999 asking to stand down the ambulance as the patient was now asleep and comfortable. Family want to wait until the morning. The EMD checked with the CSUP (who was the same CSUP who triaged earlier) who confirmed that would be acceptable.	Audio of call
C7	0723hrs	999 call was received from Mr Bradford's vehicle	Mr Bradford requests an ambulance, was dispatched	Audio of call
C8	0740hrs	Ambulance arrived	Paramedic recorded a history of diarrhoea and vomiting, blood in faeces, and approximately 10 bowel movements over the last 24 hours. Coco reportedly sick every 30 minutes.	Interview record and SWAST Notes
C9	0748hrs	Observations	CRT 2-5 seconds, HR 108 bpm, O <sub>2</sub> saturations 94%	
C10	0750hrs	Ambulance left scene		
C11	0827hrs	Arrived at ED		ED Notes
C12	0832hrs	Handover		SWAST Notes ED Notes
C13	1020hrs	Observations	All observations within normal range Blood pressure and weight not assessed	

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C14	Unknown	Seen by ED Locum Registrar	Seen by the Paediatric nurse in the Emergency Department and reviewed by the locum Registrar. Nurse gave a fluid challenge to parents. Possible Rat Poison ingestion excluded by Toxbase. Diagnosis gastroenteritis	Clinical record of clinical review
C15	1230hrs	Discharged home	Discharged with gastroenteritis advice, for the family to continue with the fluid challenge and to return if any concerns.	
26 July 2017				
C16	1229hrs	999 Call	D&V persisted Mrs Bradford makes 999 call	SWAST recording
C17	1255hrs	Ambulance arrived	Assessed by Paramedic history of bloody diarrhoea and vomiting	SWAST Notes
C18	1304hrs	Observations	AVPU Alert, CRT <2, RR 24, HR 149, Sp O <sub>2</sub> 98, Blood Glucose 14.4, Temp 37.9	
C19	1350hrs	Observations	AVPU Alert, CRT <2, RR 23, HR 148, Sp O <sub>2</sub> 98	
C20	1324hrs	Ambulance left scene		
C21	1408hrs	Arrived at RCHT		
C22	1420hrs	Admitted to ED		ED Admission record
C23	1459hrs	Triaged by Nurse 8	Triaged and passed to Paediatric ED nurse	ED Admission record interview notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C24	1505hrs	Clerked by Dr B	History of fresh red blood, watery stools, flecks of brown/red blood in vomit, doubly incontinent for the last 24 hours. Not tolerating anything orally Confused, disorientated and hallucinating. Dr B recalls that this triggered a 'red flag'.  Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 6 red flags Clinical Shock 5 Red flags	ED Admission record Interview notes
C25	1505hrs	Observations	HR 124, RR 32, BP Unobtainable, Weight 16.1kg, CRT 3 secs, Temp 37.3 °C, O <sub>2</sub> 96%, BM 18.1, Ketones 2.6	Paediatric assessment documentation
C26	1538hrs	Blood taken	HCO <sub>3</sub> 21, Hb 175, WCC 22.5, Platelets 278, Na 136, K 4.2, Urea 8.9, Creatinine 51, CRP 52, Glucose 13.2	Electronic Patient Record
C27	1603hrs	Blood gas results (Immediately available)	Unclear when reviewed. high sugar noted pH 7.4, pCO <sub>2</sub> 5.2, HCO <sub>3</sub> 21.6, BE -0.8, Lactate 4.2, Hb 195, Na137, K3.5, Glucose 12.8,	Electronic Patient Record and Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C28	1630hrs	Reviewed by Dr B and Dr C	Dr C (Registrar) was in the department at the time, Coco's case escalated directly to him and jointly reviewed. Impression: 1.Clinically dehydrated from gastroenteritis not tolerating oral fluids/food 2.Possible diabetic ketoacidosis Plan: IV access and blood tests - IV fluids to run at a maintenance rate (54ml/hr calculated on her weight)	Clinical notes Interview notes
C29	1630hrs	Staff Handover on Polkerris Ward	Handover on Polkerris Ward - Dr C joined after reviewing Coco in ED. Handover led by Dr D (resident on call evening shift) and attended by Dr E (resident on call during day and on call from home that night).	
C30	1715hrs	IV Fluid 500mls started	0.9%Normal Saline and 5% Dextrose and 5mmols KCl 54ml/hr	IV prescription sheet
C31	1834hrs	Electronic observations	Temp 37.4 °C, Resp rate 30/min and HR 140 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C32	1930hrs	Admitted to Polkerris ward	Admitted by Nurse 4 into a side room at the bottom of the ward due to diarrhoea and vomiting, so required isolation for infection control reasons.	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C33	2036hrs	Blood gas results (Immediately available)	A repeat blood sugar test performed as part of a blood gas test, the result was 12.4 mmol/l which was a reduction towards the normal range. Results reviewed at 2200hrs pH 7.4, pCO <sub>2</sub> 3.8, HCO <sub>3</sub> 23.1, BE -3.1, Lactate 3.9, Hb 184, Na 130, K4.1, Glucose 12.4,	Clinical notes and Electronic Patient Record
C34	2041hrs	Electronic observations	Temp – not obtained, Resp rate 28 breaths/min and HR 168 bpm. No blood pressure recorded	
C35	2100hrs	Dr P started duty	Covering Fistral Ward, Polkerris Ward, HDU, Neonates and Paediatric observation ward.	Clinical record / interview notes
C36	2148hrs	Electronic observations	Apyrexial, Resp rate 24/min and HR 155 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C37	2200hrs	Dr P Clinical Review	<p>First clinical review since arrival on ward. Plan:</p> <ul style="list-style-type: none"> <li>• Fluid bolus 0.9% Saline 10ml/kg over 30mins / 1 hour</li> <li>• Monitor strict input / output</li> <li>• Repeat bloods 0200hrs + blood gas + fluid review</li> <li>• Monitor glucose</li> <li>• Monitor BP</li> <li>• Re weigh in the morning</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 4 red flags Clinical Shock 5 Red flags</p> <p>Blood gas results from 2036hrs reviewed</p>	Clinical notes
C38	2236hrs	IV Paracetamol given	240mg IV Pain score 0	JAC Report
C39	2300hrs	Fluid bolus given	0.9% Normal Saline 160mls over 60mins	IV Prescription sheet

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C40	2345hrs	Nurse 5 review	Documented: High heart rate Eyes appear dark and sunken Being unable to obtain a blood pressure as Coco was "so distressed" Apyrexial Cold peripheries CRT = 2secs Passed urine Awaiting stool specimen Blood gas obtained unclear where results recorded	Clinical notes
<b>27 July 2017</b>				
C41	0000hrs	IV Fluid 500mls started	0.9% Normal Saline 500mls +10mmols KCl 54ml/hr	IV Prescription chart
C42	0013hrs	Electronic observations	Apyrexial, Resp rate 32/min and HR 144 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C43	0100 hrs	Dr P undertakes a clinical review	Plan to continue	Clinical notes
C44	0207hrs	Blood results	Unclear when reviewed Na 133, K 3.8, Urea 9.5, Creatinine 47	Electronic Patient Record
C45	0230hrs	Nurse review	IV fluids paused whilst bloods taken. Blood gas specimen clotted therefore to be repeated. No blood pressure taken	Clinical notes



Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C46	0254hrs	Electronic Observations	Apyrexial, Resp rate 32/min and HR 168 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C47	0301hrs	Blood gas results (Immediately available)	<p>Blood gas results demonstrated a compensated metabolic acidosis picture with an increasing base deficit of -6.0 suggesting that Coco's body was working harder to compensate.</p> <p>Lactate remains abnormally high at 3.2 suggesting ongoing tissue perfusion problems.</p> <p>Unclear when results reviewed</p> <p>pH 7.45, pCO<sub>2</sub> 3.5, HCO<sub>3</sub> 21.3, BE -6.0, Lactate 3.2, Hb 189, Na133, K4.5, Glucose 7.1,</p>	Electronic Patient Record
C48	0400hrs	Clinical Review Dr P	Dr P clinical review documentation written in retrospect – recorded at 0400hrs (see 0100hrs entry)	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C49	0420hrs	Clinical review Dr P	<p>Raised heart rate Cool peripheries Capillary refill time (CRT) of 3 seconds Plan:</p> <ul style="list-style-type: none"> <li>• For Coco to receive a further 10ml/kg fluid bolus</li> <li>• To Increase fluid maintenance by 5% as replacement for dehydration.</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 3 red flags Clinical Shock 4 Red flags</p>	Clinical notes
C50	0428hrs	Electronic observations	Temp not checked, Resp rate 28/min and HR 177bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C51	0430hrs	Fluid bolus given and IV fluid 500ml stopped	0.9% Normal Saline 160mls over 30mins	IV prescription chart
C52	0435hrs	Nurse 5 review	<p>No blood pressure Heart rate elevated Repeat blood gas obtained</p>	Clinical notes
C53	0500hrs	IV Fluid started	0.9%Normal Saline and 5% Dextrose and 10mmols KCl 500mls 70ml/hr	IV prescription chart
C54	0506hrs	Electronic observations	Temp 37.5, Resp rate 22/min and HR 165 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C55	0644hrs	Electronic observations	Temp 39.2, Resp rate 28/min and HR 181 bpm. No blood pressure recorded	

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C56	0725hrs	Nurse 5 review	No blood pressure recorded Raised temperature Heart rate raised Continues to have loose stools and vomiting No stool specimen	Clinical notes Interview notes
C57	0745hrs	Clinical review Dr P	<ul style="list-style-type: none"> <li>Alert</li> <li>Eyes slightly less sunken</li> <li>Mucous membranes dry</li> <li>Heart rate 160 bpm</li> <li>Pyrexial 39.2</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 5 red flags Clinical Shock 4 Red flags</p>	Clinical notes
C58	0846hrs	Blood gas results (Immediately available)	Reviewed at 1043hrs pH 7.44, pCO <sub>2</sub> 3.6, HCO <sub>3</sub> 20.9, BE -5.9, Lactate 2.4, Hb 170, Na135, K3.8, Glucose 8.0	Electronic Patient Record
C59	0856hrs	Blood taken	Seen at 1258hrs and marked as checked at 1549hrs HCO <sub>3</sub> 20, Hb 165, WCC 24.7, Platelets 173, Na 134, K 4.1, Urea 11.1, Creatinine 48, CRP 75	Electronic Patient Record
C60	1005hrs	Fluid bolus given	0.9% Normal Saline 160mls over 30mins 10ml/kg	IV prescription chart

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C61	1043hrs	Dr E Ward round	<p>Tachypnoeic with a respiratory rate of 44 breaths / minute and a clear chest on auscultation</p> <p>Had a central and peripheral Capillary refill time of less than 2</p> <p>Moist mucous membranes, Cracked lips</p> <p>Alert, lying in bed, interacting – saying words</p> <p>Soft abdomen with bowel sounds present</p> <p>Plan:</p> <ul style="list-style-type: none"> <li>• a stool culture,</li> <li>• chase blood results and add additional blood tests blood gases and check blood ketones</li> <li>• discussion with the microbiologist re prescribing of antibiotics.</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84):</p> <p>Coco showed:</p> <p>Clinical Dehydration 4 red flags</p> <p>Clinical Shock 3 Red flags</p> <p>Bloods from previous day and blood gas results from 0846 reviewed as part of ward round</p>	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C62	1054hrs	Electronic observations	Temp 37.6 °C, Resp rate 26/min and HR 185 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C63	1150hrs	Nurse 6 review	No blood pressure taken Coco remained limp and lacking in energy. Continues to retch but had not actively vomited. Continues to have loose stools, remains tachycardic with a temperature of 37.6  Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 2 red flags Clinical Shock 1 Red flags	Clinical notes
C64	1217hrs	Electronic observations	Temp 38.3 °C, Resp rate 24/min and HR 168 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record
C65	1230hrs	IV Paracetamol given	240mg IV Pain score 0	JAC Report
C66	1300hrs	IV Fluid 500ml	0.9% Normal Saline and 5% Dextrose and 10mmols KCl started cannula came out – re-sited est 14.00 70ml/hr	IV prescription chart
C67	1320hrs	Care taken over by Nurse 7		Clinical notes
C68	1509hrs	Electronic observations	Temp 37.8, Resp rate 24/min and HR 162 bpm. No blood pressure recorded	Clinical notes and Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C69	1545hrs	Attempted to contact Microbiology	Four attempts were made to contact microbiology but that there was no answer.	Clinical notes
C70	1630	Dr H starts shift and attends staff handover		
C71	1641hrs	Electronic Observations	Temp 37.8 °C, Resp rate 24/min and HR 161 bpm. No blood pressure recorded	Electronic Patient Record
C72	1831hrs	Electronic Observations	Apyrexial, Resp rate 26/min and HR 168 bpm. No blood pressure recorded	

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C73	1840hrs	Senior Review by Dr H	<ul style="list-style-type: none"> <li>• Acute bacterial gastroenteritis -on going losses both vomiting and diarrhoea.</li> <li>• No blood passed since yesterday,</li> <li>• Pyrexial during the day.</li> <li>• Tachycardic - 160/min throughout the day.</li> <li>• Fluid balance difficult to assess due to losses not clearly recorded / identifiable.</li> <li>• Mother reported Coco passing high coloured urine and in small quantities.</li> <li>• Plan:</li> <li>• Take repeat blood tests and dependent upon the results decide whether to start antibiotics or not</li> <li>• A further stool specimen was requested</li> <li>• Further bloods requested – these were not done for another 3 hours (21.46)</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 4 red flags Clinical Shock 2 Red flags</p>	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C74	2010hrs	Nurse review 7	<ul style="list-style-type: none"> <li>Thick yellow bile vomits</li> <li>IV fluids continued</li> <li>Apyrexial.</li> <li>Further bloods to be taken that evening</li> <li>No blood pressure recording was noted.</li> </ul>	Clinical notes and interview notes
C75	2030hrs	IV Paracetamol given	240mg IV Pain score 0	JAC Report
C76	2044hrs	Electronic Observations	Apyrexial, Resp rate 32/min and HR 154 bpm. No blood pressure recorded	Electronic Patient Record
C77	2100hrs	IV Fluid 500ml	0.9%Normal Saline and 5% Dextrose and 10mmols KCl 70ml/hr	IV prescription chart
C79	2146hrs	Blood taken	Requested at 1840hrs HCO <sub>3</sub> 18, Hb 158, WCC 34, Neuts 8.89, Platelets 72, Na 139, K 4.4, Urea 12.6, Creatinine 76, CRP 160	Electronic Patient Record
C80	2207hrs	Blood gas results (Immediately available)	Reviewed at 0100hrs pH 7.35, pCO <sub>2</sub> 4.9, HCO <sub>3</sub> 19.5, BE -4.8 Lactate 2.3, Hb 162, Neuts 26.9, Na141, K4.2, Glucose 8.4	



Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C81	2230 hrs (estimated)	Clinical review by Dr P	<p>Entry timed at 0100 on 28/7/17</p> <p>Gastroenteritis with 5-10-% dehydration</p> <p>Bloods (2146) suggestive of HUS</p> <p>Bilious vomiting</p> <p>High heart rate and respiratory rate, cool hands and feet, restless, normal abdominal examination. Gained 3kg in weight.</p> <p>Diagnosis HUS</p> <p>Plan – discuss with Dr P abdominal Xray and surgical review</p>	Clinical notes
C82	2248hrs	Chloral hydrate given	Mrs Bradford requested that coco be given some additional pain relief to settle her – Chloral hydrate was administered. Vomited most of the dose	JACS Report Interview record
C83	2258hrs	Electronic Observations	Apyrexial, Resp rate 30/min and HR 157 bpm. No blood pressure recorded	Electronic Patient Record
C84	2300 hrs (estimated)	Phone call Dr P to Dr H	<p>Agrees diagnosis is HUS</p> <p>Plan: Discuss with Bristol renal team</p> <p>Reduce IV fluids to losses</p> <p>Repeat bloods 6 hourly</p> <p>Not for antibiotics</p> <p>Catheterise</p>	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C85	2320hrs	Call to BRHC	Phone call Dr P to Dr K Discussed the use of antibiotics as Dr K concerned that there had been translocation of the gut bacteria to the blood stream. Dr K agreed to speak consultant (Dr L) and follow up with Dr P.	BCH notes
C86	2340hrs	Nurse 5 Review	<ul style="list-style-type: none"><li>• Maintaining own airway</li><li>• Respiratory rate high side of normal for age</li><li>• Heart rate remains elevated</li><li>• Apyrexial</li><li>• Unable to obtain BP</li><li>• Capillary refill time centrally 2seconds</li></ul> Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 4 red flags Clinical Shock 2 Red flags	Clinical notes and interview notes Clinical notes
C87	2355hrs	Nurse 5 Review	Unable to see assess urine output. Placed on potty but unsuccessful	
28 July 2017				
C88	0015	Electronic Observations	Temp not taken, Resp rate 34/min and HR 157 bpm. First blood pressure recording 85/65 mmHg	Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C89	0100hrs	Surgical Review	Does not require surgical intervention at this point. To be re reviewed am	Clinical notes

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
90	0400hrs	Dr P Clinical Review written at 0630hrs	<p>Noted to have a high heart rate and respiratory rate, normal CRT but with “feet and hands cool”, blood pressure now obtained and is low at 85/65 she was described as “restless”. Documented as having “eyes less sunken” and “not oedematous” A repeat weight was done showing Coco had gained 3kg since admission. Abdominal examination was normal, bilious vomiting noted and brown liquid stool noted.</p> <ul style="list-style-type: none"> <li>• Discuss with the renal team (at Bristol)</li> <li>• Reduce IV fluids to just losses and insensible losses</li> <li>• Repeat bloods 6 hourly</li> <li>• Not for antibiotics</li> <li>• Surgical review of abdomen and abdominal x-ray</li> <li>• Catheterise</li> <li>• Not for platelet transfusion</li> <li>• Parents updated</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed:</p> <ul style="list-style-type: none"> <li>• Clinical Dehydration 7 red flags</li> <li>• Clinical Shock 5 Red flags</li> </ul>	Clinical Review
C91	0109hrs	Electronic Observations	Temperature 35.5, Resp rate 28/min and HR 151 bpm. No blood pressure recorded	Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C92	0216hrs	Electronic Observations	Temperature 36.1 °C, Resp rate 29/min and HR 155 bpm. No blood pressure recorded	Electronic Patient Record
C93	0245hrs	IV Paracetamol given	IV Paracetamol 240mg – 10mg in 1ml given	JAC Report
C94	0327hrs	Electronic Observations	Temp not taken, Resp rate 30/min and HR 161 bpm. Blood pressure 68/48 mmHg	Electronic Patient Record
C95	0330hrs	Nurse 5 review	<ul style="list-style-type: none"> <li>Heart rate remains high</li> <li>PEWS – 2-4 due to:</li> <li>Heart rate</li> <li>Blood pressure</li> <li>Parental concern</li> <li>High respiratory rate</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 3 Red flags Clinical Shock 5 Red flags</p>	Clinical notes and interview notes
C96	0330hrs	IV fluids replace losses	0.9%Normal Saline and 5% Dextrose 500mls 11.8ml/hour	IV prescription chart

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C97	0400hrs	Clinical review Dr P	<p>Blood pressure obtained with a doppler Catheterisation attempted, unable to advance beyond 5cms</p> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 2 Red flags Clinical Shock 8 Red flags</p>	Clinical notes
C98	0400hrs	Fluid bolus given	0.9% Normal saline 170mls 10ml/kg over 30 mins	IV prescription chart
C99	0415hrs	IV Morphine given	Morphine Sulphate 1.6mg Pain score 0	JAC Report
C100	0430hrs	Nurse Review 5	<ul style="list-style-type: none"> <li>• Rate of IV altered due to fluid bolus currently running over 30mins.</li> <li>• IV morphine given as prescribed as parents concerned over Coco's pain, very restless.</li> <li>• Abdominal x-ray obtained.</li> <li>• Parents kept informed.</li> <li>• IV rate changed - To start replacement of ongoing losses</li> <li>• Rate of 54mls to run until 0600hrs and then be recalculated.</li> </ul>	Clinical notes
C101	0442hrs	Blood taken	HCO <sub>3</sub> 14, Hb 147, WCC 41.4, Neuts 32.9, Platelets ?Clot 40 , Na 141, K 4.6, Urea 16.2, Creatinine 118, CRP 191	Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C102	0456hrs	Phone call Dr P to Dr K BRHC	<p>Dr P reported blood pressure was unrecordable</p> <p>Dr K stressed the importance of getting an accurate urine output (as the patient was still not catheterised) and the importance of obtaining a blood pressure. Advised using the doppler or a manual cuff to repeat the recording and validate the accuracy of the results.</p> <p>Dr K recorded impression as “peri arrest” and at interview confirmed that this accurately reflected her concern for the acuity of the patient at this time.</p>	Clinical notes
C103	0457hrs	Electronic Observations	Temperature 35.9, Resp rate 30/min and HR 150 bpm. No blood pressure recorded	Electronic Patient Record
C104	0600hrs	IV Morphine given	Morphine Sulphate 1.6mg Pain score 0	JAC Report
C105	0700hrs	Dr H calls Dr P for an update		Interview
C106	0630hrs	Observations (documented taken at 0400)	BP obtained by doppler, systolic 80-90, heart rate 150, temperature 35.9	Clinical notes
C107	0633hrs	Blood gas results (Immediately available)	<p>Reviewed at 0633hrs</p> <p>pH 7.27, pCO<sub>2</sub> 4.3, HCO<sub>3</sub> 15.6, BE -12.2</p> <p>Lactate 4.7, Hb 153, Na146, K6.1, Glucose 5.5</p>	Electronic Patient Record

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C108	0635hrs	Allergic Reaction	Omeprazole 40mg Infusion ? Genuine allergic reaction No details recorded	JAC Report
C109	0700hrs	Clinical review Dr P	Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 3 Red flags Clinical Shock 5 Red flags  Urine output remains difficult to assess as no catheter  Bloods from 0442hrs reviewed More settled following morphine D/W Dr H and Renal Team BRHC Renal Reg to discuss with Cons – No fluid bolus until called back. Prepare for transfer to BBRHC.	Clinical notes and interview record
C110	0700hrs	Phone call Dr P and Dr K	Call to Renal Registrar BRHC	
C111	0745hrs	Transfer planning	Bristol discuss how to accommodate Coco	



Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C112	0800hrs	Clinical review Dr H	<p>For ITU review cold peripheries, CRT 4 seconds peripherally, 2-3 seconds centrally, heart rate up, respiratory rate up, oxygen saturations reduced Plan:</p> <ul style="list-style-type: none"> <li>Discussed with Prof Dr L (renal consultant) – advised fluid bolus, bicarbonate and ITU/WATCh referral</li> <li>Care discussed with Dr U from the WATCh team Bristol who recommended arterial access for BP, urinary catheter, further fluid bolus. WATCh team will come to retrieve</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 5 red flags Clinical Shock 8 Red flags</p>	

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C113	0810hrs	Nurse 5 Review	<ul style="list-style-type: none"> <li>• Coco maintaining own airway</li> <li>• Respiratory rate raised</li> <li>• Raised heart rate</li> <li>• Apyrexial</li> <li>• ? Accurate blood pressure as Coco very distressed</li> <li>• Continues to have loose stools – difficult to ascertain if Coco has passed any urine</li> <li>• Small vomits / retching</li> <li>• Coco 'really distressed'</li> <li>• Glasgow coma scale 14/15</li> <li>• ?In pain – analgesia given</li> <li>• Coco still not slept – 'Parents feel she is scared'</li> </ul> <p>Mapped against Diarrhoea and vomiting in children (NICE guideline CG84): Coco showed: Clinical Dehydration 3 Red flags Clinical Shock 7 Red flags</p>	
C114	0845hrs	Pain Relief	IV Paracetamol 240 mg	
C115	0900hrs	ICU Review Dr N	Asked to help record Coco's BP – Coco more settled so told he was not required	
C116	0910hrs	IV Fluids	0.9% Normal saline 170mls 10ml/kg over 30 mins	IV prescription chart

Timeline Ref	Date & Time	Event	What happened / Additional information	Source
C117	0915hrs	Dr H phones Dr M at WATCH	Referred to WATCH To be discussed with renal team. Recommended further fluid bolus – Sodium Bicarbonate	
C118	0930hrs	IV fluids	0.9% Normal Saline, 8.4% Sodium bicarbonate 2mmol/kg Total 62ml over 3 hours	
C119	0945hrs	Fluid bolus given	0.9% Normal Saline 170mls/30mins	
C120	1000hrs	ICU review Dr N	Plan: <ul style="list-style-type: none"> <li>Documented by Dr N as: “Agree urgent transfer to ICU and onward WATCH retrieval to PICU</li> <li>I will escort patient to ICU with full monitoring, outreach and paed support”</li> </ul>	Clinical record and interview notes
C121	Am – written in retrospect timed at 0800hrs written at 1130hrs	Nurse 10 Review	Reported Coco asleep and settled More difficult to rouse Maintaining own airway Noticeably oedematous	
C122	1049-1700hrs	Dr M + N several phone calls	Coco receives treatment in adult intensive care	WATCH clinical record
C123	1049hrs	Admitted to ICU	Prepared for transfer to Bristol	Critical Care clinical notes
C124	1700hrs	Discharged from ICU	Discharge into the care of the WATCH retrieval team	WATCH clinical record
C125	2110hrs	Admitted to Bristol PICU		Bristol Notes WATCH clinical record

## Appendix 5: Clinical presentation tables

All tables in this appendix have been generated using the clinical indicators for dehydration taken from NICE Interactive Flow chart for fluid and nutritional in children with diarrhoea and vomiting. Interpret symptoms and signs taking into account risk factors for dehydration. More numerous and more pronounced symptoms and/or signs of clinical dehydration indicate greater severity. For clinical shock, one or more symptoms or signs would be present.

**Red flag (\*) symptoms and signs** may help to identify children at increased risk of progression to shock. If in doubt, manage as if there are red flag symptoms or signs. Dashes (–) indicate that these clinical features do not specifically indicate shock.

Each table has been completed from information reviewed in the medical and nursing entries.

















## CP1 – Overview of Clinical Presentation




25-07	26-07	26-07	27-07	27-07	27-07	27-07	28-07	28-07	
No time	1550	2200	0420	0745	1043	1840	2340	0327	0700
No clinically detectable dehydration									
Appears Well									
Alert and responsive									
Normal urine output									
Skin colour unchanged									
Warm extremities									
Alert and responsive									
Skin colour unchanged									
Warm extremities									
Eyes not sunken									
Moist mucuous membranes (except after a drink)									
Normal heart rate									
Normal breathing pattern									
Normal peripheral pulses									
Normal capillary refill time									
Normal skin turgor									
Normal blood pressure									

25-07	26-07	26-07	27-07	27-07	27-07	27-07	28-07	28-07	
No time	1550	2200	0420	0745	1043	1840	2340	0327	0700
Clinical dehydration									
Appears to be unwell or deteriorating									
Altered responsiveness (for example irritable, lethargic)									
Decreased urine output									
Skin colour unchanged									
Warm extremities									
Altered responsiveness (for example irritable, lethargic)									
Skin colour unchanged									
Warm extremities									
Sunken eyes									
Dry mucous membranes (except for 'mouth breather')									
Tachycardia									
Tachypnoea									
Normal peripheral pulses									
Normal capillary refill time									
Reduced skin turgor									
Normal blood pressure									












25-07	26-07	26-07	27-07	27-07	27-07	27-07	28-07	28-07	
No time	1550	2200	0420	0745	1043	1840	2340	0327	0700
Clinical Shock									
-									
Decreased level of consciousness									
-									
Pale or mottled skin									
Cold extremities									
Decreased level of consciousness									
Pale or mottled skin									
Cold extremities									
-									
Tachycardia									
Tachypnoea									
Weak peripheral pulses									
Prolonged capillary refill time									
-									
Hypotension ( decompensated shock)									

CP2 – Clinical Picture 25 July

















Clinical Picture 25 July				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP3 – Clinical Picture 26 July 1505

Clinical Picture 26 July 1505					
Increasing severity of dehydration					
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock	
	Appears well		Appears to be unwell or deteriorating	-	
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness	
	Normal urine output		Decreased urine output	-	
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin	
	Warm extremities		Warm extremities	Cold extremities	
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness	
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin	
	Warm extremities		Warm extremities	Cold extremities	
	Eyes not sunken		Sunken eyes	-	
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-	
	Normal heart rate		Tachycardia	Tachycardia	
	Normal breathing pattern		Tachypnoea	Tachypnoea	
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses	
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time	
	Normal skin turgor		Reduced skin turgor	-	
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)	
	No clinically detectable dehydration		Clinical dehydration		Clinical Shock









CP4 – Clinical Picture 26 July 2200




Clinical Picture 26 July 2200				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP5 – Clinical Picture 27 July 0420


Clinical Picture 27 July 0420				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)


	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP6 – Clinical Picture 7 July 0745

















Clinical Picture 27 July 0745				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)




 No clinically detectable dehydration

 Clinical dehydration









 Clinical Shock




CP7 – Clinical Picture 27 July 1043

Clinical Picture 27 July 1043				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)









	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP8 - Clinical Picture 27 July 1840

Clinical Picture 27 July 1840				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

















	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP9 – Clinical Picture 27 July estimated 2230

Clinical Picture 27 July Estimated to be 2230				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)









	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP10 – Clinical Picture 0330

Clinical Picture 28 July 0327				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP11 – Clinical Picture 28 July 0400




Clinical Picture 28 July 0400				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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CP12 – Clinical Picture 28 July 0700

Clinical Picture 28 July Review at 0700				
Increasing severity of dehydration				
Symptoms (remote and face-to-face assessments)	No clinically detectable dehydration	Clinical dehydration		Clinical shock
	Appears well		Appears to be unwell or deteriorating	-
	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output		Decreased urine output	-
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive		Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged		Skin colour unchanged	Pale or mottled skin
	Warm extremities		Warm extremities	Cold extremities
	Eyes not sunken		Sunken eyes	-
	Moist mucous membranes (except after a drink)		Dry mucous membranes (except for 'mouth breather')	-
	Normal heart rate		Tachycardia	Tachycardia
	Normal breathing pattern		Tachypnoea	Tachypnoea
	Normal peripheral pulses		Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time		Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor		Reduced skin turgor	-
	Normal blood pressure		Normal blood pressure	Hypotension (decompensated shock)

	No clinically detectable dehydration		Clinical dehydration		Clinical Shock
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## Appendix 6: Observations 26 July – 28 July

Taken from Electronic Patient Record

	Reference	Ob1	Ob2	Ob3	Ob4	Ob5	Ob6	Ob7	Ob8	Ob9	Ob10	Ob11
Date	Normal Range	26.07	26.07	26.07	27.07	27.07	27.07	27.07	27.07	27.07	27.07	27.07
Time		18:34	20:41	21:48	00:13	02:54	04:28	05:06	06:44	10:54	12:17	15:09
Blood Pressure	Systolic 90-110	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained	Not obtained
Heart Rate	80-120	140	168	155	145	168	177	165	181	185	168	162
Respiratory Rate	20-30	30	28	24	32	32	28	22	28	26	24	24
Temperature	36.5 – 37.5	37.4	Not obtained	36.4	36.5	36.8	Not obtained	37.5	39.2	37.6	38.3	37.8
Oxygen Saturation	95-97	96	97	96	97	98	96	95	97	96	96	100
Pain Score	0-10	0	0	0	0	0	0	0	0	0	0	0
Weight		Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded
Capillary Refill Time	0-2 seconds	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3
PEWS		1	2	1	2	2	1	1	2	1	1	1
Nurse or family concerned		No	Yes	No	No	No	No	No	No	No	No	No
Escalation		No Escalation	NIC	No Escalation	NIC	NIC	No Escalation	No Escalation	No Escalation	No Escalation	No Escalation	No Escalation

	Reference	Ob12	Ob13	Ob14	Ob15	Ob16	Ob17	Ob18	Ob19	Ob20	Ob21	Ob22
Date	Normal Range	27.07	27.07	27.07	27.07	28.07	28.07	28.07	28.07	28.07	28.07	28.07
Time		16:41	18:31	20:44	22:58	00:15	01:09	02:16	03:27	04:57	06:30	07:00
Blood Pressure	Systolic 90-110	Not obtained	Not obtained	Not obtained	Not obtained	85/65	Not obtained	Not obtained	68/48	Not obtained	80-90 Systolic <sup>1</sup>	Not obtained
Heart Rate	80-120	161	168	154	157	151	155	161	150	150	150	150
Respiratory Rate	20-30	24	26	32	30	34	28	29	30	30	30	30
Temperature	36.5 – 37.5	37.8	36.2	36.4	37	Not Obtained	35.5	36.1	Not Obtained	35.9	35.9	35.9
Oxygen Saturation	95-97	95	99	96	97	96	95	96	97	96	96	-
Pain Score	0-10	0	0	0	0	0	0	0	0	0	-	-
Weight		Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded
Capillary Refill Time	0-2 seconds	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	Less than or equal to 3	3 Seconds	3 seconds
PEWS		1	1	2	1	4	2	1	3	3	-	-
Nurse or family concerned		No	No	No	No	Yes	No	No	Yes	Yes		
Escalation		No Escalation	No Escalation	NIC	No Escalation	NIC, Junior Doctor, Registrar	NIC	No Escalation	NIC, Junior Doctor	NIC, Junior Doctor		

Values outside of normal range are in red

1 Taken with doppler

NIC - Nurse In Charge



## Appendix 7: Blood and Gas Results; 26 July – 28 July

Date/ Time	RCHT Range	26/7 15:38 Blood	26/7 16:03 Gas	26/7 20:36 Gas	27/7 02:07 Blood	27/7 03:01 Gas	27/7 08:46 Gas	27/7 08:56 Blood	27/7 21:46 Blood	27/7 22:07 Gas	28/7 04:42 Blood	28/7 06:33 Gas
	Reference	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
pH	7.31 – 7.41		7.4	7.4		7.45	7.44			7.36		7.27
pCO <sub>2</sub>	5.5 – 6.8		5.2	3.8		3.5	3.6			4.9		4.3
HCO <sub>3</sub>	19 - 28	21	21.6	23.1		21.3	20.9	20	18	19.5	14	15.6
BE	-3 - +3		-0.8	-3.1		-6.0	-5.9			-4.8		-12.2
Lactate	0.5 – 1.6		4.2	3.9		3.2	2.4			2.3		4.7
Hb	96 - 148	175	195	184		189	170	165	158	162	147	153
WCC	4.9 – 12.9	22.5						24.7	34		41.4	
Neuts	1.5 – 7.7							8.9	26.9		32.9	
Platelets	150 – 400	278						173	72		Clot?40	
Na	136 - 145	136	137	130	133	133	135	134	139	141	141	146
K	3.4 – 4.5	4.2	3.5	4.1	3.8	4.5	3.8	4.1	4.4	4.2	4.6	6.1
Urea	2.5 – 6.5	8.9			9.5			11.1	12.6		16.2	
Creatinine	28 - 52	51			47			48	76		118	
CRP	0 - 5	52						75	160		191	
Glucose	3.9 – 5.8	13.2	12.8	12.4		7.1	8.0			8.4		5.5

(Values out of range are in red)

# Blood Indicator Explanations











Value	Value explanation
pH	pH
pCO <sub>2</sub>	Carbon dioxide
HCO <sub>3</sub>	Bicarbonate
BE	Base Excess
Lactate	Lactate
Hb	Haemoglobin
WCC	White Cell Count
Neuts	Neutrophils
Platelets	Platelets
Na	Sodium
K	Potassium
Urea	Urea
Creatinine	Creatinine
CRP	C-reactive Protein
Glucose	Glucose

## Appendix 8: NICE guidance fluid and nutritional management in children with diarrhoea and vomiting

This table has been generated using the clinical indicators for dehydration taken from NICE Pathway Interactive Flow chart for fluid and nutritional management in children with diarrhoea and vomiting.

More numerous and more pronounced symptoms and/or signs of clinical dehydration indicate greater severity. For clinical shock, one or more symptoms or signs would be present.

**Red flag (\*) symptoms and signs** may help to identify children at increased risk of progression to shock. If in doubt, manage as if there are red flag symptoms or signs. Dashes (–) indicate that these clinical features do not specifically indicate shock.

Increasing severity of dehydration			
	No clinically detectable dehydration	Clinical dehydration	Clinical shock
Symptoms (remote and face-to-face assessments)	Appears well	 Appears to be unwell or deteriorating	–
	Alert and responsive	 Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Normal urine output	Decreased urine output	–
	Skin colour unchanged	Skin colour unchanged	Pale or mottled skin
	Warm extremities	Warm extremities	Cold extremities
Signs (face-to-face assessments)	Alert and responsive	 Altered responsiveness (for example, irritable, lethargic)	Decreased level of consciousness
	Skin colour unchanged	Skin colour unchanged	Pale or mottled skin
	Warm extremities	Warm extremities	Cold extremities
	Eyes not sunken	 Sunken eyes	–
	Moist mucous membranes (except after a drink)	 Dry mucous membranes (except for 'mouth breather')	–
	Normal heart rate	 Tachycardia	Tachycardia
	Normal breathing pattern	 Tachypnoea	Tachypnoea
	Normal peripheral pulses	Normal peripheral pulses	Weak peripheral pulses
	Normal capillary refill time	 Normal capillary refill time	Prolonged capillary refill time
	Normal skin turgor	 Reduced skin turgor	–
	Normal blood pressure	 Normal blood pressure	Hypotension (decompensated shock)

## Appendix 9: Fluid management elements

There are four elements to be considered when prescribing IV fluids for children. These are detailed in the NICE guidance.



Intravenous fluid therapy in children and young people hospital; NICE Guideline 29 (second, third and fourth elements)

Fluid and nutritional management in children with diarrhoea and vomiting; NICE Pathway (first element)

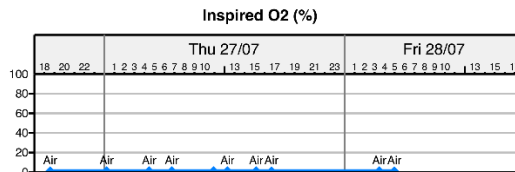
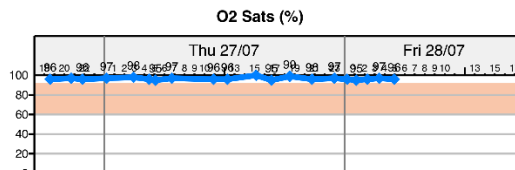
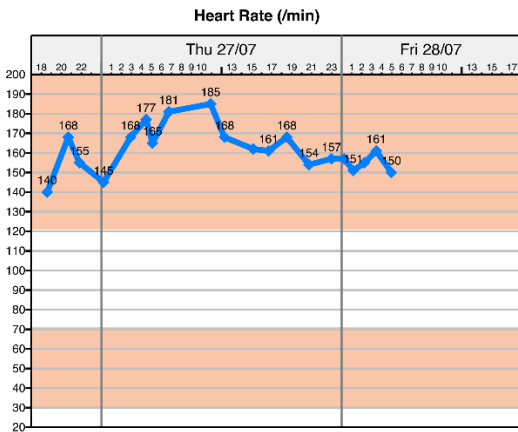
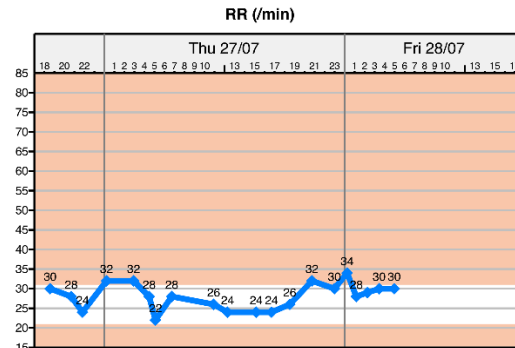
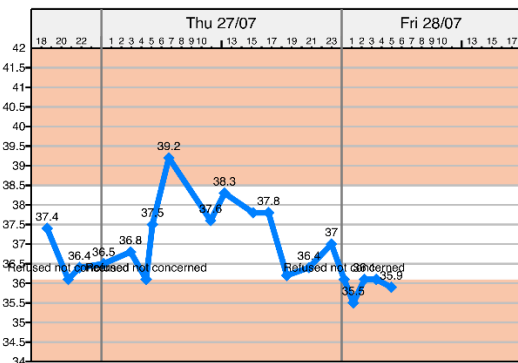
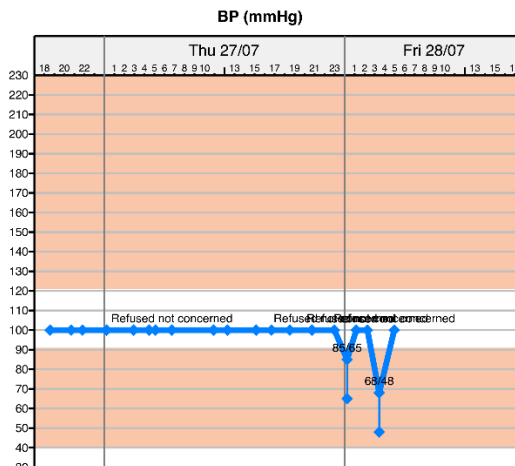
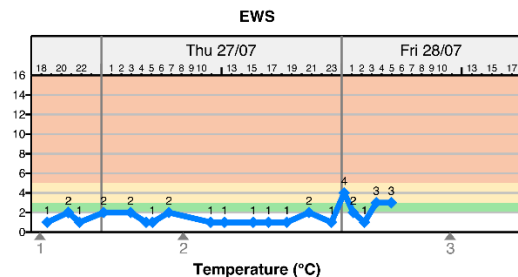
## Appendix 10 : Electronic patient record trend view



### Observations 26/07/2017 17:50 to 28/07/2017 17:56

Printed 09/04/2018 12:45 by Baulchmg

Name <b>BRADFORD, Coco Rose</b>	Hospital Number [REDACTED]	NHS Number [REDACTED]	DoB <b>Born</b> [REDACTED]	Current Ward/Bed
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### Comments

1. Set to PEWS - 5 to 11 years on admission, 26/07 17:51
2. Change to Adult NOT LIVE EOBS WARD, Transfer, 27/07 08:09

## Appendix 11: Quality governance timeline

Date	Event	Source
3/8/2017	Multi-disciplinary team review – case of the week	Medical Records
4/8/2017	Incident reported on Datix	Datix
8/8/2017	RCHT 72-hour report.	RCHT Datix
12/8/2017	Letter ITU Consultant summarising Coco's care in RCHT ITU	Letter to GP copied to Mr and Mrs Bradford
14/8/2017	Letter to Coco's parents from Paediatric Consultant offering to meet	Letter to Mr and Mrs Bradford
31/8/2017	Request for Coco's notes from Mr and Mrs Bradford	Request for access to personal data document
18/9/2017	Confirmation of costs for notes to be released from disclosure office	Email from disclosure office to Mrs Bradford
21/9/2017	Confirmation from RCHT disclosure office that request being processed and notes not available for meeting on 22/9	Email from disclosure office to Mrs Bradford
26/9/2017	Meeting between BRHC and family	Family interview
29/9/2017	Medical records received by family from RCHT	Family interview
6/10/2017	Mr and Mrs Bradford requests further 'missing' notes	Email from Mrs Bradford to disclosure office
9/10/2017	Bristol Child Death Review meeting	Minutes of the Child Death Review
13/10/2017	Clinicians Meeting with family	Letter to Mrs Bradford following the meeting
16/10/2017	Letter to Mr and Mrs Bradford from Consultant confirming discussions on 13 October	Letter to Mr and Mrs Bradford
19/10/2017	RCHT Mortality review meeting	Minutes of meeting
19/10/2017	Complaint letter sent to RCHT from Coco's parents	Complaint letter from Mr and Mrs Bradford

23/10/2017	FOI request ref 2043 acknowledged by RCHT	Email from information governance team to Mr and Mrs Bradford
23/10/2017	Letter of response to complaint from RCHT to Coco's parents.	Letter from CEO to Mr and Mrs Bradford
31/10/2017	Confirmation of SI email that states that this incident does meet SI criteria	Email to Director of Nursing
31/10/17	Telephone call to Mr and Mrs Bradford confirming they would like an LRM	Email to Mrs Bradford
1/11/2017	Confirmation Mr and Mrs Bradford would like an LRM	Email to Director of Nursing
1/11/2017	RCHT confirmation that an IO has been appointed	Email to Clinical Director
1/11/2017	Confirmation of a new point of contact	Email to Mrs Bradford
2/11/2017	Case reported on STEIS on the serious incident reporting document	STEIS
9/11/2017	Mr and Mrs Bradford contacts disclosure office for update	Email to disclosure office from Mrs Bradford
10/11/2017	Disclosure office apologises for delay in obtaining information	Email from disclosure office to Mrs Bradford
15/11/2017	Request for a date for the LRM	Email from Mrs Bradford
15/11/2017	Response to Mr and Mrs Bradford confirming that she is setting up the LRM	Email to Mrs Bradford
20/11/2017	Meeting with BRHC and family to discuss the CDR report	Family interview
21/11/2017	Phone call between Mr and Mrs Bradford and Paediatric Governance	Family interview
21/11/2017	Mr and Mrs Bradford express disappointment with lack of communication. Requests confirmation of who will be attending the LRM and states aware that the case has been escalated to the Medical Director.	Email from Mrs Bradford
21/11/2017	Request to disclosure office for missing results from Mr and Mrs Bradford	Email to disclosure office from Mrs Bradford
22/11/2017	Apologies to Mr and Mrs Bradford for lack of contact re LRM and informs them of a name of someone who will be in touch about this.	Family interview Email from Mrs Bradford
24/11/2017	Phone call to Mr and Mrs Bradford meeting set up with Medical Director	File note Family interview

8/12/2017	Meeting between family members and Medical Director and Paediatric Consultant Medical Director Business Manager	Family interview File note from MD
12/12/2017	Confirmation to Mr and Mrs Bradford that Facere Melius is co-ordinating the external review	Email to Mrs Bradford
14/12/2017	Phone call to Mr and Mrs Bradford to discuss external investigation and to arrange the LRM.	Email to Mrs Bradford Family interview
19/12/2017	Offer of dates for LRM from to Mr and Mrs Bradford and acknowledgement that a set of questions will be sent by the family.	Email to Mrs Bradford
19/12/2017	Request regarding who will be attending LRM from Mr and Mrs Bradford	Email from Mrs Bradford
21/12/2017	Date family would prefer for LRM confirmed and who will be attending from Mr and Mrs Bradford	Email from Mrs Bradford
2/1/2018	List of questions for the LRM meeting sent from Mr and Mrs Bradford and request of time and who will be attending meeting	Email from Mrs Bradford
3/1/2018	Phone call to Mr and Mrs Bradford confirming questions will not be answered at meeting	Family interview
10/1/2018	Letter received by Mr and Mrs Bradford. This set out the process for the investigation and a copy of the duty of candour leaflet. Confirms Associate Director of Nursing is key contact in absence of Medical Director.	Letter to Mrs Bradford
16/01/2017	Mr and Mrs Bradford request of time and place of meeting	Email from Mrs Bradford
17/01/2017	Confirmation of time and place of meeting to Mr and Mrs Bradford. Confirms that three people attending.	Email to Mrs Bradford
19/01/2017	Meeting held at RCHT with family, three RCHT staff and two people from FM. Terms of reference agreed to be drawn up.	Minutes of meeting held on 19/01/2017
22/01/2018	Family questions sent from Mr and Mrs Bradford	Email from Mrs Bradford
24/01/2018	Mr and Mrs Bradford inform that a meeting to agree terms of reference with FM was to take place on 25/1 with MB	Email to Mrs Bradford
25/01/2018	Meeting with FM to discuss terms of reference	FM team



1/2/2018	Mr and Mrs Bradford requests copy of terms of reference	Email from Mrs Bradford
2/2/2018	Additional family questions sent by Mr and Mrs Bradford to inform the terms of reference	Email from Mrs Bradford
7/2/2018	Mr and Mrs Bradford request sent for the minutes of the meeting held on 19/01	Email from Mrs Bradford
7/2/2018	Request from Mr and Mrs Bradford for confirmation that questions have been received and passed to FM. Receipt is confirmed.	Email from Mrs Bradford Email to Mrs Bradford
9/2/2018	Request for minutes of the meeting held on 19/01 to Mr and Mrs Bradford later that day	Email from Mrs Bradford Email from to Mrs Bradford
12/2/2018	Mr and Mrs Bradford ask if level 1 investigation has been conducted and asks for confirmation of when the level 3 investigation was commissioned. Mr and Mrs Bradford states that she has not been informed of any delays achieving the deadline of 1 <sup>st</sup> May	Family interview
13/02/2018	Further request from Mr and Mrs Bradford for the minutes of the 19/1, the level 1 investigation findings and date for level 3 investigation	Email from Mrs Bradford
13/02/2018	Apology for 'not being in touch' minutes of meeting sent to Mr and Mrs Bradford informed that terms of reference being chased.	Email to Mrs Bradford
13/2/2018	Confirmation to Mr and Mrs Bradford that minutes have been sent and request to answer questions regarding the level 1 investigation and the date that the level 3 external investigation commissioned.	Email to Mrs Bradford
16/2/2018	Mr and Mrs Bradford emails stating she is still waiting to be informed about the investigations, terms of reference and deadline for reporting from KCCG	Email from Mrs Bradford
16/2/2018	FM commissioned to conduct the investigation	FM
19/02/2018	Confirmation to Mr and Mrs Bradford that level 1 investigation is not being conducted and FM commissioned on 16/2	Email to Mrs Bradford
22/2/2018	Mr and Mrs Bradford raise concerns about FM involved in discussions regarding the case prior to being commissioned. Also confirms	Email from Mrs Bradford

	that she has not received the terms of reference and raises duty of candour issues	
5/3/2018	Update to Mr and Mrs Bradford re terms of reference with an anticipation that they will be shared the following week and an offer to meet FM on 12 <sup>th</sup> March to discuss	Email to Mrs Bradford
5/3/2018	Invitation to Mr and Mrs Bradford to meet with investigation officers on 6 <sup>th</sup> April	Email to Mrs Bradford
12/3/2018	Meeting held with Mr and Mrs Bradford and FM to discuss terms of reference	FM Email to Mrs Bradford Family interview
15/3/2018	Confirmation that meeting on 12/3 took places and terms of reference received. Update about information requests for the investigation. Informing family of annual leave	Email to Mrs Bradford

## Appendix 12: Parents' questions

Questions:	Responses from the investigation team:
1. On reflection and after reading the notes again, do you think that you should have admitted Coco on Tuesday and started IV fluids immediately?	This is addressed in section 8
2. As per the CQC recommendations did you have 2 registered specialist paediatric nurses in the ED at the times Coco was there?	This is addressed in section 9, however the CQC report was not published until 9 October 2017
3. Why did it take from 14:08 pm until 20:00pm to obtain IV access and start IV fluids, a delay of almost 6 hours?	This is addressed in section 8
4. Was this managed in a timely and acceptable manner?	This is addressed in section 8
<p><i>On Coco's admission to HDU on 26/07/17 it is noted as Gastroenteritis and HUS. Yet it is noted on the CDR report that HUS wasn't diagnosed until the results of a blood test from midnight on 27/07/17. Please explain</i></p> <p>5. Who was responsible for HUS diagnosis on Wednesday 26/7 at 16:00 and on what clinical basis was this diagnosed?</p>	<p>On the 26/7 the working diagnosis was gastroenteritis to watch for HUS</p> <p>Coco was not a receiving HDU care on the 26/7, this is discussed in Section 8</p>
<p>6. If you diagnosed Coco with HUS on Weds 26/7 at 16.00 and by Thursday am [27/7] her urea and creatinine levels had risen significantly, and filtration cannot be performed at Treliske why was there a delay in transferring Coco to a hospital with filtration facilities?</p> <p><i>PEWS Score from ED 26/07 Signed KC Please explain how an initial PEWS score of 3 was given with a heart rate of 124 and a temperature of 37.6 at 14:40 and just over 2 ½ hours later with a heart rate of 194 and a temperature of 37.8 at 17:25 the PEWS score is noted as 2!!</i></p>	<p>Issues relating to PEWS are discussed in sections 8 and 9</p> <p>Timely escalation to intensive care is discussed in section 8</p>

Questions:	Responses from the investigation team:
7. How was this possibly calculated and missed and not acted upon sooner?	Issues relating to PEWS are discussed in section 8 and 9
8. Why was this not picked up sooner and how accurate are these figures? Was the disease severity adequately recognised?	Urine output was not reliably established, this is discussed in section  Coco's severity was not adequately recognised, this is address in section 8
9. Do you still think that this was adequately and managed? Results from the internal investigation?	Overall no, this was not adequately managed  This is detailed in section 8, 9 and the conclusion
10. Please explain how fluid balances were calculated at 23:00 o 26/07?	It cannot be confirm how the balances were calculated. The investigation team agree the calculation doesn't make sense, this is addressed in section 8
11. Were fluid balance and urine output concerns raised and actioned in a timely manner?	No they weren't and this is addressed in section 8
12. Why was Coco noted to have an allergic reaction to Omeprazole @ 6.53 on 28/07 yet given more Omeprazole @ 8.56 (2 hours later) on 28/07?	It has not been possible to be established have if there was a genuine allergic reaction, as symptoms recorded at that time do not indicate this. It was not able to identify who entered the allergic reaction on the system and therefore this has been unable to explore this further
13. Do you think you adequately managed Coco's pain?	IV paracetamol is given, but not at regular intervals and there were periods where Coco did not receive pain relief. This is addressed in section 8 and 9
14. Why did you give Coco, a child with severe gastric inflammation, Chloral Hydrate?	It has not been possible to identify the reason why this was prescribed
15. Please explain your procedure for calculating pain scores on children that are non verbal and/or have Autism.	This is addressed in section 8 and 9
16. Was timing of the antibiotic therapy appropriate?	This is addressed in section 8 and 9

Questions:	Responses from the investigation team:
<p>17. Can you please explain how a Paediatric Consultant recorded a PEWS score of 2 with</p> <p><i>Heart Rate 181 bpm</i></p> <p><i>Temp 39.2</i></p> <p><i>Resp Rate 28</i></p> <p>How was this missed?</p>	<p>Issues relating to PEWS scores are discussed in section 8 and 9</p>
<p>17a. On 27/7 there is a comment in the notes about Coco looking improved</p>	<p>This is addressed in section 8</p>
<p>18. Failure to obtain an accurate BP. We were informed that manual BP is not used on Paediatric wards. Why not?</p> <p>BP and catheter insertion was not possible because Coco was 'restless and unco-operative' and later noted that 'earlier catheterization would have been helpful, although this was difficult with Coco's restlessness, autism and communication'.</p>	<p>Blood pressure monitoring and catheterisation is addressed in section 8 and 9</p>
<p>19. Referring to the CDR report, about BP and Catheterisation. Who documented this and on what basis?</p>	<p>Both catheterisation and blood pressure monitoring are addressed in section 8 and 9. A referral to the learning disability team at RCHT would have been beneficial to assist in these areas</p>
<p>20. Was the timing of referral to Bristol appropriate?</p> <p><i>Referral to the WATCH Retrieval Team was made the following morning at 8:40am 28/07/17</i></p> <p>Who advised this and on what clinical basis was this justified?</p> <p>Who decided to delay referral and decide what Bristol may have decided and on what clinical basis was this possibly justified?</p>	<p>Referral to WATCH and transfer to Bristol are discussed in section 8</p>
<p>21. What caused the cardiovascular decompensation after intubation?</p> <p><i>"it was discussed that CB probably developed severe septic shock which caused the acute severe hypotension. This may also have been exacerbated by a degree of intravascular dehydration"</i></p>	<p>Hypotension is a known response to intubation and would have been exacerbated by intravascular dehydration</p>

Questions:	Responses from the investigation team:
22. Do you think this may possibly have been due to the delay in appropriate fluid management?	This is discussed in section 8 and 9
23. Please evidence Ultrasound scan and accompanying notes Was surgical management indicated?  <i>"Abdominal x-ray showed significant bowel wall thickening in the right side of the abdomen (consistent with intramural haemorrhage) and dilation of bowel in the left hand side of the abdomen and abdominal ultrasound was recommended and carried out at 2:27am 28/07/17"</i>	This is discussed in section 8 and 10
24. How on earth did you reach this conclusion and is it common practice to 'scribble' this on the back of Paediatric notes, seemingly never to be seen again? <i>Reference MDT "case of the week"</i>  <i>"no deficiencies on care were identified"</i>	Case of the week is discussed in section 10  It would be standard practice to record all interventions and discussions. Record keeping is discussed in sections 8 and 9
25. What category was the Datix Entry from 04/08/17?	This is discussed in section 10
26. If we hadn't questioned the 'care' Coco received, and I use that word loosely, do you honestly think that you would have contacted us as set out in the NHSLA Duty of Candour guidelines?	Duty of candour is discussed in section 10
27. In your 'expert' medical opinions given the evidence and documentation before you, do you think the delay in admitting Coco, the failure to manage fluids promptly and adequately and the failure to recognise a rapidly deteriorating patient could have contributed to her death? If not, please provide the evidence and proof that the outcome couldn't have been different.	This is discussed throughout section 8, 9 and the conclusion

## **Appendix 13: RCHT Clinical Guideline for Intravenous Fluid Selection for Previously Well Children Aged 1 Month to 16 Years**

# **CLINICAL GUIDELINE FOR INTRAVENOUS FLUID SELECTION FOR PREVIOUSLY WELL CHILDREN AGED 1 MONTH TO 16 YEARS.**

## **1. Aim/Purpose of this Guideline**

1.1. This guideline provides a flow chart for the selection of intravenous fluids for previously well children aged 1 month to 16 years. It excludes renal, cardiac, endocrinology, diabetic ketoacidosis and acute burns patients.

## **2. The Guidance**

2.1. See flow chart for guidance on page 2.



**Hyponatraemia may develop as a complication of any fluid regime**

**If shock is present administer 20ml/kg Sodium Chloride 0.9%, (10ml/kg in the setting of trauma)**  
Repeat if necessary and call for senior help

**Symptomatic hyponatraemia is a medical emergency**

Estimate any fluid **deficit** see *Clinical Guideline for D and V in children under 5 yrs of age*. If clinically dehydrated 50ml/kg over 24hours. If shocked up to 100ml/kg over 24hours and replace as **Sodium Chloride 0.9%** over a minimum of 24 hrs (slower if sodium abnormalities) Check plasma electrolytes

Calculate **volume** of **maintenance** and **replacement** fluids and select fluid **type**

### **Volume** of intravenous **maintenance** fluid

<b>First 10kg:</b>	100 ml/kg/day	}	Up to a maximum of
<b>Subsequent 10kg:</b>	50 ml/kg/day		2500ml/day (males)
<b>Each additional kg:</b>	20 ml/kg/day		2000ml/day (females)

### **Volume** of intravenous **replacement** fluid (to replace losses. May need frequent recalculation)

Fluids used to replace on-going fluid losses should reflect the composition of the fluid being lost.

**Sodium chloride 0.9%** or **Sodium chloride 0.9% with glucose 5%** will be appropriate in most cases. Hartmann's solution is an alternative.

### **Type** of intravenous maintenance fluid

Many children may be safely administered **Sodium Chloride 0.45% with glucose 5%**, but see below:

In some circumstances children should be administered isotonic fluids such as **Sodium Chloride 0.9% with glucose 5%**

**These circumstances include;**

- Plasma sodium less than 135 mmol/L,
- intravascular volume depletion,
- CNS infection,
- peri- and post-operative patients,
- hypotension,
- head injury,
- bronchiolitis,
- sepsis,
- gastroenteritis [as per NICE guidance]
- Salt wasting conditions.

*Consider adding potassium chloride, up to 40mmol/L, to maintenance fluids once plasma potassium concentration is known.*

Those requiring both maintenance fluids **and** replacement of **ongoing** losses should receive a single isotonic fluid such as **Sodium chloride 0.9%** or **Sodium chloride 0.9% with glucose 5%**

### **Monitoring**

- Send plasma electrolytes when commencing the infusion and ensure results chased promptly. (Except prior to the majority of elective surgery.)
- Check plasma electrolytes daily whilst intravenous fluids are being administered.
- If plasma electrolytes are abnormal, consider rechecking every 4-6 hours, definitely if plasma Na< 130mmol/L.
- Check plasma electrolytes if clinical features suggestive of hyponatraemia develop; these features include nausea, vomiting, headache, irritability, altered level of consciousness, seizure or apnoea.
- Where possible, all children on intravenous fluids should be weighed prior to the commencement of therapy and be reweighed each day.
- Document accurate fluid balance daily. Assess urine output – oliguria may be due to inadequate fluid, renal failure, obstruction or the effect of ADH.
- Some acutely ill children with increased ADH secretion may benefit from restriction of maintenance fluids to two-thirds

### 3. Monitoring compliance and effectiveness

Element to be monitored	Compliance with guideline
Lead	Audit lead
Tool	Audit
Frequency	Annual or at time of review
Reporting arrangements	Audit and guidelines meeting
Acting on recommendations and Lead(s)	Required actions will be identified and completed in a specified timeframe
Change in practice and lessons to be shared	Required changes to practice will be identified and actioned within a relevant time frame. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders

### 4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement.

#### 4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

## Appendix 1. Governance Information

<b>Document Title</b>	Clinical guideline for intravenous fluid selection for previously well children aged 1 month to 16 years.			
<b>Date Issued/Approved:</b>	13 November 2013			
<b>Date Valid From:</b>	13 November 2013			
<b>Date Valid To:</b>	1 November 2016			
<b>Directorate / Department responsible (author/owner):</b>	Dr. M.Thorpe Consultant Paediatrician			
<b>Contact details:</b>	01872 252716			
<b>Brief summary of contents</b>	Clinical guideline for intravenous fluid selection for previously well children aged 1 month to 16 years. Including flow chart.			
<b>Suggested Keywords:</b>	Paediatrics Fluids			
<b>Target Audience</b>	RCHT ✓	PCH	CFT	KCCG
<b>Executive Director responsible for Policy:</b>	Medical Director			
<b>Date revised:</b>	November 2013			
<b>This document replaces (exact title of previous version):</b>	Intravenous fluids guideline			
<b>Approval route (names of committees)/consultation:</b>	Audit and guidelines meeting Consultant paediatricians			
<b>Divisional Manager confirming approval processes</b>				
<b>Name and Post Title of additional signatories</b>	Not required			
<b>Signature of Executive Director giving approval</b>	{Original Copy Signed}			
<b>Publication Location (refer to Policy on Policies – Approvals and Ratification):</b>	Internet & Intranet	✓	Intranet Only	
<b>Document Library Folder/Sub Folder</b>	Paediatrics			
<b>Links to key external standards</b>	none			
<b>Related Documents:</b>	National Patient Safety Association Alert No. 22. (28 March 2007).			

Training Need Identified?	No
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### Version Control Table

Date	Version No	Summary of Changes	Changes Made by (Name and Job Title)
June 2007	V1.0	Initial Issue	Dr. M. Thorpe Consultant paediatrician
November 2013	V2.0	Re format and content review and update	Dr. M. Thorpe Consultant paediatrician Tabitha Fergus Deputy ward manager

**All or part of this document can be released under the Freedom of Information Act 2000**

**This document is to be retained for 10 years from the date of expiry.**

**This document is only valid on the day of printing**

### **Controlled Document**

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy on Document Production. It should not be altered in any way without the express permission of the author or their Line Manager.

## Appendix 2. Initial Equality Impact Assessment Form

Name of the strategy / policy / proposal / service function to be assessed (hereafter referred to as <i>policy</i> ) (Provide brief description): Clinical Guideline for intravenous fluid selection for previously well children aged 1 month to 16 years.			
Directorate and service area: Child health		Is this a new or existing Policy? existing	
Name of individual completing assessment: T.Fergus		Telephone: 01872252800	
1. Policy Aim* Who is the strategy / policy / proposal / service function aimed at?	Clear guidance for intravenous selection for previously well children aged 1 month – 16 years.		
2. Policy Objectives*	Evidence based standardised practice.		
3. Policy – intended Outcomes*	Evidence based standardised practice.		
4. *How will you measure the outcome?	Audit		
5. Who is intended to benefit from the policy?	Children/ Young people and families.		
6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy?  b) If yes, have these *groups been consulted?  C). Please list any groups who have been consulted about this procedure.	no		

<b>7. The Impact</b>			
Please complete the following table.			
Are there concerns that the policy <b>could</b> have differential impact on:			
Equality Strands:	Yes	No	Rationale for Assessment / Existing Evidence
Age		X	

<b>Sex</b> (male, female, trans-gender / gender reassignment)		<b>X</b>	
<b>Race / Ethnic communities /groups</b>		<b>X</b>	
<b>Disability -</b> learning disability, physical disability, sensory impairment and mental health problems		<b>X</b>	
<b>Religion / other beliefs</b>		<b>X</b>	
<b>Marriage and civil partnership</b>		<b>X</b>	
<b>Pregnancy and maternity</b>		<b>X</b>	
<b>Sexual Orientation,</b> Bisexual, Gay, heterosexual, Lesbian		<b>X</b>	
<p>You will need to continue to a full Equality Impact Assessment if the following have been highlighted:</p> <ul style="list-style-type: none"> <li>• You have ticked “Yes” in any column above and</li> <li>• No consultation or evidence of there being consultation- this <u>excludes</u> any <i>policies</i> which have been identified as not requiring consultation. <b>or</b></li> <li>• Major service redesign or development</li> </ul>			
8. Please indicate if a full equality analysis is recommended.		<b>Yes</b>	<b>No x</b>
9. If you are not recommending a Full Impact assessment please explain why.			
No negative aspects			
Signature of policy developer / lead manager / director T.Fergus		Date of completion and submission 30/10/13	
Names and signatures of members carrying out the Screening Assessment	1. 2.		

**Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead,**  
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa,  
Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust’s web site.

Signed \_\_\_\_\_ T.Fergus \_\_\_\_\_

Date \_\_\_\_\_ 30/10/13 \_\_\_\_\_