Document Title:	**MANAGEMENT OF DIARRHOEA AND VOMITING IN CHILDREN YOUNGER THAN 5 YEARS**		
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Approval Group / Committee(s):	n/a	**Date:**	n/a
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Consulted With: *this must include **Pharmacy** if the document has any reference to medication*	**Post/ Approval Committee/ Group:**	**Date:**
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Related Trust Policies (to be read in conjunction with)	(Refer to the main body of the text) 04072 Hand Hygiene 08038 Aseptic Non Touch Technique 05105 Blood Borne Viruses Policy including needle stick/sharps injury. 06061 Children's Early Warning Tool

Document Review History:			
Version No:	**Authored/Reviewer:**	**Summary of amendments/ Record documents superseded by:**	**Issue Date:**
1.0	Jogesh Kapadia		December 2009
2.0	Carol Newman		July 2013
2.1	Victoria Machell	Policy Extension	7th June 2016
3.0	Victoria		17 January 2017
4.0	Dr Chavakula	Full Review	19th December 2019

Contents

18.0 Appendices

1.0 Purpose

1.1 This guideline applies to children younger than 5 years who present at hospital with symptoms of gastroenteritis. It covers diagnosis, assessment of dehydration, fluid management, nutritional management and the role of antibiotics.

1.2 For the purposes of this guideline, an 'infant' is defined as a child younger than 1 year.

2.0 Background

2.1 Gastroenteritis is very common, with many children having more than one episode a year. Approximately 10% of children younger than 5 years present with gastroenteritis to healthcare services each year

2.2. Infective gastroenteritis in young children is characterised by the sudden onset of diarrhoea, with or without vomiting. Most cases are due to an enteric virus, but some are caused by bacterial or protozoal infections.

2.3 The diagnosis of gastroenteritis is usually a clinical one. Culture of a stool sample may be occasionally necessary to determine the pathogen. The illness usually resolves without treatment within days; however, symptoms are unpleasant and affect both the child and family or carers. Severe diarrhoea can quickly cause dehydration, which may be life threatening.

2.4 Adequate fluid intake is the priority to prevent dehydration. In children oral rehydration is preferred. If the child is vomiting and unable to retain oral fluids or they have features of shock, severe dehydration, or an alternative life-threatening diagnosis they require urgent hospital admission and may require fluid resuscitation and further appropriate treatment. Adjunctive anti-emetics are useful to assist with oral rehydration. Antibiotics are not routinely recommended but will be discussed.

2.5 Antibiotics may be indicated if stool culture reveals a causative bacteria. Notification should also follow in cases of suspected cholera, infectious bloody diarrhoea, haemolytic uraemia syndrome or food poisoning. (In England this constitutes the local Consultant in Communicable Disease Control and Public Health England).

3.0 Clinical Diagnosis

3.1 Suspect gastroenteritis if there is a sudden change in stool consistency to loose or watery stools, and/**or** a sudden onset of vomiting.

3.2 If you suspect gastroenteritis, ask about:

- Recent contact with someone with acute diarrhoea and/or vomiting **and**
- Exposure to a known source of enteric infection (possibly contaminated water or food) **and**

- Recent travel abroad.

3.3 Be aware that in children with gastroenteritis:

- Diarrhoea usually lasts for 5–7 days, and in most it stops within 2 weeks;
- Vomiting usually lasts for 1–2 days, and in most it stops within 3 days;
- Consider any of the following as possible indicators of diagnoses other than gastroenteritis:
- Fever:
    - temperature of 38°C or higher in children younger than 3 months;
    - temperature of 39°C or higher in children aged 3 months or older;
- Shortness of breath or tachypnoea;
- Altered conscious state;
- Neck stiffness;
- Bulging fontanelle in infants;
- Non-blanching rash;
- Blood and/or mucus in stool;
- Bilious (green) vomit;
- Severe or localised abdominal pain;
- Abdominal distension or rebound tenderness.

4.0 Laboratory Investigations for Stools

4.1 Consider performing stool microbiological investigations if:

- The child has recently been abroad;
- The diarrhoea has not improved by day 7;
- There is uncertainty about the diagnosis of gastroenteritis.

4.2 Perform stool microbiological investigations if:

- You suspect septicaemia **or**
- There is blood and/or mucus in the stool **or**
- The child is immunocompromised.

4.3 Notify and act on the advice of the Infection Prevention Team, if you suspect an outbreak of gastroenteritis.

4.4 If stool microbiology is performed:

- Collect, store and transport stool specimens as advised by the investigating laboratory
- Provide the laboratory with relevant clinical information.

4.5 Perform a blood culture if giving antibiotic therapy.

4.6 In children with Escherichia coli O157:H7 infection, seek specialist advice on monitoring for haemolytic uraemic syndrome.

5.0 Clinical Assessment of Dehydration and Shock

5.1 Recognise that the following are at increased risk of dehydration:

- Children younger than 1 year, particularly those younger than 6 months;
- Infants who were of low birth weight;
- Children who have passed more than five diarrhoeal stools in the previous 24 hours;
- Children who have vomited more than twice in the previous 24 hours;
- Children who have not been offered or have not been able to tolerate supplementary fluids before presentation;
- Infants who have stopped breastfeeding during the illness;
- Children with signs of malnutrition.

5.2 Use table 1 to detect clinical dehydration and shock. (Appendix A) and Children Early Warning Score (CEWT).

5.3 Suspect hypernatraemic dehydration if there are any of the following:

- Jittery movements;
- Increased muscle tone;
- Hyperreflexia;
- Convulsions;
- Drowsiness or coma.

6.0 Laboratory Investigations for Assessing Dehydration.

6.1 Do not routinely perform blood biochemical testing.

6.3. Consider performing a capillary gas before commencing oral ondansetron.

6.3 Measure plasma sodium, potassium, urea, creatinine and glucose concentrations if:

- Intravenous fluid therapy is required or
- There are symptoms and/or signs that suggest hypernatremia.

6.4 Measure venous blood acid–base status and chloride concentration if shock is suspected or confirmed.

7.0 Fluid Management

(Refer to Appendix B)

7.1 Primary prevention of dehydration in children with gastroenteritis but without clinical dehydration:

- Continue breastfeeding and other milk feeds;

- Encourage fluid intake;
- Discourage the drinking of fruit juices and carbonated drinks, especially in those at increased risk of dehydration;
- Offer oral rehydration salts (ORS) solution as supplemental fluid to those at increased risk of dehydration.

7.2 In treating dehydration use ORS solution to rehydrate children, including those with hypernatremia, unless intravenous fluid therapy is indicated.

7.3 In children with clinical dehydration, including hypernatraemic dehydration: use low-osmolarity ORS solution (240–250 mOsm/l) for oral rehydration therapy.

- Give 50 ml/kg ORS solution over 4 hours;
- Give the ORS solution frequently in small amounts to avoid risk of vomiting(1-2ml/kg every 5 to 10minutes);
- Consider supplementation with their usual fluids, (including milk feeds or water, but not fruit juices or carbonated drinks) if they refuse to take sufficient quantities of ORS solution and do not have red flag symptoms or signs (see table 1 Appendix A);
- Consider giving the ORS solution via a nasogastric tube if they are unable to drink it or if they vomit persistently.

8.0 Ondansetron

8.1 Ondansetron as an antiemetic has been well established as an adjunct to oral rehydration in children with mild to moderate dehydration. Contraindications include

- Ages < 6 months;
- Weight < 8kg
- Concomitant use of drugs that prolong QT interval, congenital or acquired long QT
- Arrhythmia
- Hypersensitivity/previous adverse reaction to ondansetron
- Electrolyte supplementation/diuretic therapy
- K+ <3.5 or >5.5mEq/L

8.1.1 Ondansetron could be given to children who have vomited within 30-60 mins of their initial ORT trial. It would be reasonable to perform a blood gas before commencing ondansetron if one has not already been performed.

8.2 The dosage for Ondansetron as a one off dose is as follows:

Weight(kg)	Dose(mg)	Preparation
8-15	2	2mg(2.5ml oral solution)
15 -30	4	4mg Orodispersible film
>30	8	8mg Orodispersible film

8.3 Once ondansetron has been administered, wait 15- 30 minutes to give the Ondansetron time to take action then restart the ORT; this should be at the rate described earlier.

8.4 If ORT is subsequently tolerated, consider discharge. If vomiting continues, the patient may require nasogastric rehydration, or intravenous fluids depending on senior review and decision. The child will probably require admission to the ward for at least the next 4 hours, so arrangements for this to happen if the child is in the Emergency Department will be via usual operational pathway.

8.5 Monitor the response to oral rehydration therapy by regular clinical assessment and CEWT score.

9.0 Intravenous Fluid Therapy

Use intravenous fluid therapy for clinical dehydration if:

- Shock is suspected or confirmed
- A child with red flag symptoms or signs (see table 1 Appendix A) shows clinical evidence of deterioration despite oral rehydration therapy
- If the child persistently vomits the ORS solution, given orally or via nasogastric tube.

9.2 Treat suspected or confirmed shock with a rapid intravenous infusion of 20 ml/kg of 0.9% sodium chloride solution.

9.3 If a child remains shocked after the first rapid intravenous infusion: immediately give another rapid intravenous infusion of 20 ml/kg of 0.9% sodium chloride solution and consider possible causes of shock other than dehydration.

9.4 Consider consulting Children's Acute Transfer Service if a child remains shocked after the second rapid intravenous infusion.

9.5 When symptoms and/or signs of shock resolve after rapid intravenous infusions, start rehydration with intravenous fluid therapy.

9.6 If intravenous fluid therapy is required for rehydration (and the child is not hypernatraemic at presentation):

- Use an isotonic solution such as 0.9% sodium chloride, or 0.9% sodium chloride with 5% glucose, for fluid deficit replacement and maintenance;

- For those who required initial rapid intravenous fluid boluses for suspected or confirmed shock, add 100 ml/kg for fluid deficit replacement to maintenance fluid requirements, and monitor the clinical response;
- For those who were not shocked at presentation, add 50 ml/kg for fluid deficit replacement to maintenance fluid requirements, and monitor the clinical response;
- Measure plasma sodium, potassium, urea, creatinine and glucose at the outset, monitor regularly, and alter the fluid composition or rate of administration if necessary.

9.7 Consider providing intravenous potassium supplementation once the plasma potassium level is known.

9.8 If intravenous fluid therapy is required in a child presenting with hypernatraemic dehydration:

- Obtain urgent expert advice on fluid management;
- Use an isotonic solution such as 0.9% sodium chloride, or 0.9% sodium chloride with 5% glucose for fluid deficit replacement and maintenance;
- Replace the fluid deficit slowly – typically over 48 hours;
- Monitor the plasma sodium frequently, aiming to reduce it at a rate of less than 0.5 mmol/l per hour.

9.9 Attempt early and gradual introduction of oral rehydration therapy during intravenous fluid therapy. If tolerated, stop intravenous fluids and complete rehydration with oral rehydration therapy.

10.0 Fluid Management after Rehydration

10.1 After rehydration:

- Encourage breastfeeding and other milk feeds;
- Encourage fluid intake;
- In children at increased risk of dehydration recurring, consider giving 5 ml/kg of ORS solution after each large watery stool. These include:
    - children younger than 1 year, particularly those younger than 6 months
    - infants who were of low birth weight
    - children who have passed more than five diarrhoeal stools in the previous 24 hours
    - children who have vomited more than twice in the previous 24 hours.

10.2 Restart oral rehydration therapy if dehydration recurs after rehydration.

11.0 Nutritional Management

11.1 During rehydration therapy:

- Continue breastfeeding;
- Do not give solid foods;
- In children with red flag symptoms or signs (see table 1 Appendix A), do not give oral fluids other than ORS solution;
- In children without red flag symptoms or signs (see table 1 Appendix A), do not routinely give oral fluids other than ORS solution; however, consider supplementation with the child's usual fluids (including milk feeds or water, but not fruit juices or carbonated drinks) if they consistently refuse ORS solution.

11.2 After rehydration:

- Give full-strength milk straight away;
- Reintroduce the child's usual solid food.

11.3 Avoid giving fruit juices and carbonated drinks until the diarrhoea has stopped.

12.0 Antibiotic Therapy

12.1 Do not routinely give antibiotics to children with gastroenteritis.

12.2 Give antibiotic treatment to all children:

- With suspected or confirmed septicaemia;
- With extra-intestinal spread of bacterial infection;
- Younger than 6 months with salmonella gastroenteritis;
- Who are malnourished or immunocompromised with salmonella gastroenteritis;
- With *Clostridium difficile*-associated pseudomembranous enterocolitis, giardiasis, dysenteric shigellosis, dysenteric amoebiasis or cholera.

12.3 For children who have recently been abroad, seek specialist advice about antibiotic therapy.

12.4 Do not use anti-diarrhoeal medications.

13.0 Staff Training

13.1 All medical and nursing staff are to ensure that their knowledge, competencies and skills are up-to-date in order to complete their portfolio for appraisal.

13.2 During induction process all staff will receive instruction on current polices and guidelines.

13.3 At case presentation and junior doctor teaching will discuss D&V cases and learn from the outcomes.

13.4 Where a patient's notes have demonstrated that the appropriate action has not been taken a 'risk event form' is to be completed. This will address any further training needs for staff that require updating.

14.0 Infection Prevention

14.1 All staff should follow Trust guidelines on infection prevention ensuring that they effectively 'decontaminate their hands' before and after each procedure.

14.2 All staff should ensure that they follow Trust guidelines on infection prevention using Aseptic Non-Touch Technique (ANTT) when carrying out procedures.

14.3 D&V is highly infectious and all patients should be nursed under standard isolation precautions.

15.0 Audit and Monitoring

15.1 Audit of compliance with this guideline will be considered on an annual audit basis in accordance with the Clinical Audit Strategy and Policy (register number 08076), the Corporate Clinical Audit and Quality Improvement Project Plan and the Women's and Children's annual audit work plan; to encompass national and local audit and clinical governance identifying key harm themes. The Women's and Children's Clinical Audit Group will identify a lead for the audit.

15.2 The findings of the audit will be reported to and approved by the Multi-disciplinary Paediatric Departmental Meeting and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

15.3 The audit report will be reported to the monthly Directorate Governance Meeting (DGM) and significant concerns relating to compliance will be entered on the local Risk Assurance Framework.

15.4 Key findings and learning points from the audit will be submitted to the Clinical Governance Group within the integrated learning report.

15.5 Key findings and learning points will be disseminated to relevant staff.

16.0 Communication

16.1 Approved guidelines are published monthly in the Trust's staff newsletter that is sent via email to all staff.

17.0 Equality Impact Assessment

17.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.
(Refer to Appendix D)

18.0 References

Adapted from NICE clinical guideline [CG84] April 2009 :Diarrhoea and vomiting caused by gastroenteritis in under 5s: diagnosis and management.

http;//pathways.nice.org.uk/pathways/diarrhoea and vomiting in children; 10 January 2019

https://www.rch.org.au/clinicalguide/guideline_index/Gastroenteritis/

www.medicinescomplete.com

Appendix A

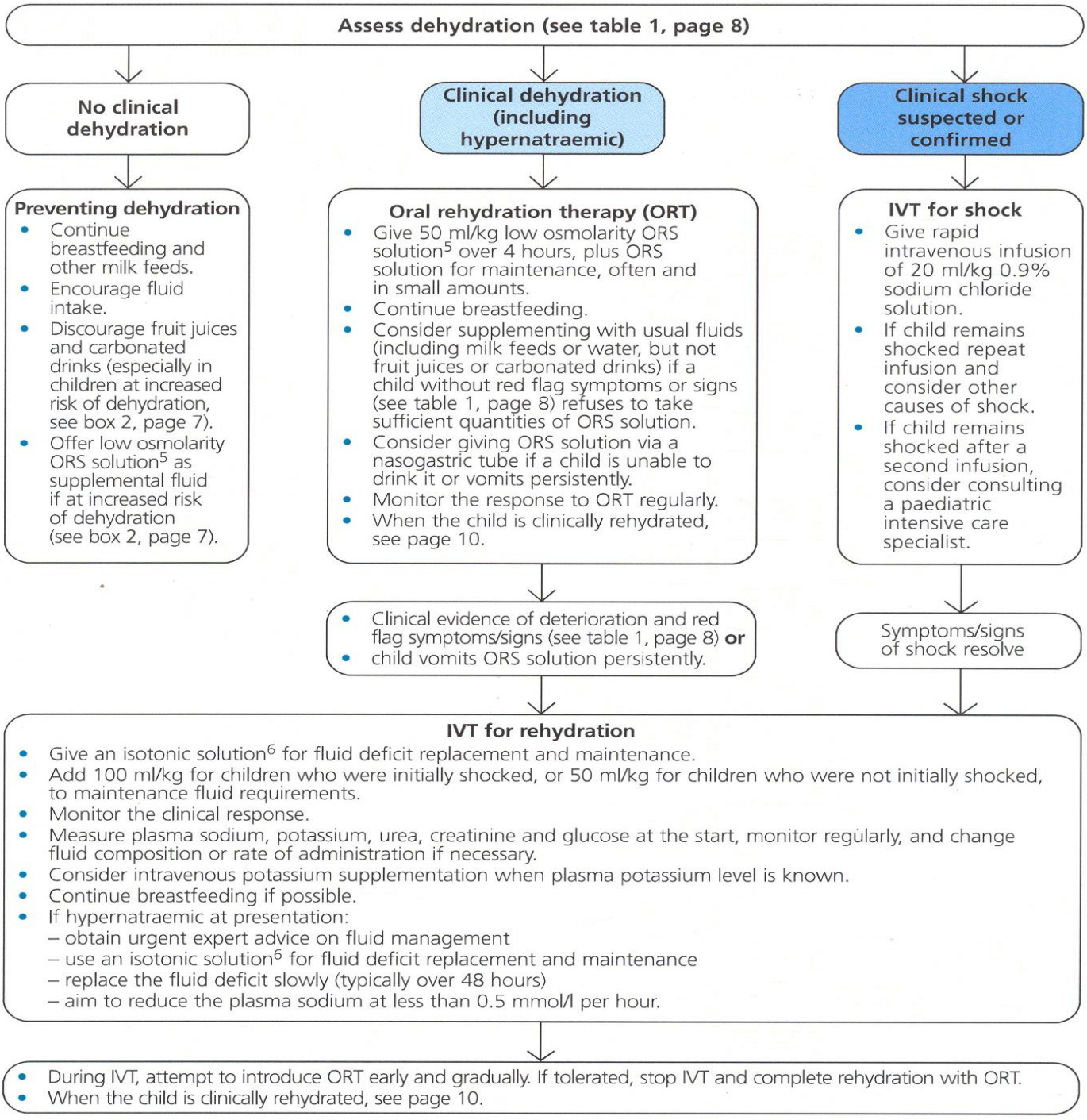
Table 1 Symptoms and signs of clinical dehydration and shock

Interpret symptoms and signs taking risk factors for dehydration into account (see 5.2). Within the category of 'clinical dehydration' there is a spectrum of severity indicated by increasingly numerous and more pronounced symptoms and signs. For clinical shock, one or more of the symptoms and/or signs listed would be expected to be present. Dashes (–) indicate that these clinical features do not specifically indicate shock. Symptoms and signs with red flags (⚑) may help to identify children at increased risk of progression to shock. If in doubt, manage as if there are symptoms and/or signs with red flags

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 B

Fluid management



[5] 240–250 mOsm/l. The 'BNFC' 2008 edition lists the following products with this composition: Dioralyte, Dioralyte Relief, Electrolade and Rapolyte.
[6] Such as 0.9% sodium chloride, or 0.9% sodium chloride with 5% glucose.

Appendix C

Reduced oral intake pathway:

Applies to reduced oral intake / fluid loss due to diarrhoea and vomiting or acute illness.

Patients who present with/or has a history of diarrhoea and/or vomiting.
□ Nursing history □ CEWT □ Consider BM especially if in intermediate risk □ Urine sample □ Consider antipyretics if febrile □ Isolate to limit cross infection.

Signs and Symptoms	LOW RISK No detectable dehydration	INTERMEDIATE RISK Clinical dehydration	HIGH RISK Clinical shock
	• Appears well • Alert and responsive	• Appears to be unwell or deteriorating • Altered responsiveness (irritable, lethargic)	• Decreased level of consciousness
	• Skin colour unchanged • Warm extremities • Normal skin turgor	•Skin colour unchanged • Warm extremities • Reduced skin turgor	• Pale or mottled skin • Cold extremities
	• Normal capillary refill time • Moist mucous membrane • Normal fontanel	• Dry mucous membranes • Normal capillary refill time	•Prolonged capillary refill time
	• Normal urine output	• Decreased urine output	
	• Normal breathing	• Tachypnoea	• Tachyphnoea
	• Normal heart rate • Normal peripheral pulse	• Tachycardia • Normal Peripheral pulse	•Tachycardia •Weak peripheral pulses
	• Eyes not sunken	• Sunken eyes	
	• Normal blood pressure	• Normal blood pressure	•Hypotension

For all patients: Continue monitoring following CEWT chart recommendation. Clinically reassess regularly. Escalate appropriately.

Dehydration risk factors: □ below 6 months of age □ underlying chronic disease □ immunodeficiency □ have vomited 3 times or more in the last 24 hours □ 6 or more episodes of diarrhoea in the past 24 hours

HIGH RISK ACTION:

Contact paediatric SPR / ED senior - consider moving to resuscitation area.

Clinical Shock suspected:

- Obtain IV/IO
- Check blood glucose
- Give 20ml/kg 0.9%Sodium Chloride

Reassess

- If required, give a second bolus

Reassess

- Consider contacting CATS

INTERMEDIATE RISK ACTION:

Begin management of clinical dehydration.

1. Trial of Dioralyte:

- Below 50kg – 12ml/kg per hour
- Above 50kg – 1000ml to be consumed within one hour
- Consider oral ondansetron

2. NG rehydration

- 50mls/kg over 3-6 hours

3. IV rehydration

- Take U&E's, Check BM. Commence 0.9% sodium chloride + 5% glucose +/- KCL

LOW RISK ACTION:

1. Continue to encourage normal fluid – breast and / or bottle feeding.
2. If not tolerating – progress to intermediate risk management.
3. If tolerating, aim for discharge. Ensure appropriate written / verbal advice has been give.

CE clinical guidelines 84. April 2009/ http://www.nice.org.uk/CG84 . Healthier 17.pdf

Appendix D: Preliminary Equality Analysis

This assessment relates to: Management of Diarrhoea and Vomiting in Children younger than 5 years / 09134

A change in a service to patients		A change to an existing policy	X	A change to the way staff work	
A new policy		Something else (please give details)	Review of existing Guideline		

Questions	Answers
1. What are you proposing to change?	Full Review
2. Why are you making this change? (What will the change achieve?)	3 year review
3. Who benefits from this change and how?	Patients and clinicians
4. **Is anyone likely to suffer any negative impact as a result of this change?** If **no**, please record reasons here and sign and date this assessment. If **yes**, please complete a full EIA.	No
5. a) Will you be undertaking any consultation as part of this change? **b) If so, with whom?**	Refer to pages 1 and 2

Preliminary analysis completed by:

Name	Dr Chavakula	**Job Title**	Paediatric Consultant	**Date**	December 2019