NHS
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Quick reference guide

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Diarrhoea and vomiting in children

Diarrhoea and vomiting caused by gastroenteritis: diagnosis, assessment and management in children younger than 5 years

NICE clinical guideline 84
Developed by the National Collaborating Centre for Women's and Children's Health

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS in 'Diarrhoea and vomiting caused by gastroenteritis: diagnosis, assessment and management in children younger than 5 years' (NICE clinical guideline 84).

Who should read this booklet?

This quick reference guide is for all healthcare professionals who care for children with diarrhoea and vomiting caused by gastroenteritis.

Who wrote the guideline?

The guideline was developed by the National Collaborating Centre for Women's and Children's Health, which is linked with the Royal College of Obstetricians and Gynaecologists. The Collaborating Centre worked with a group of healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

For more information on how NICE clinical guidelines are developed, go to www.nice.org.uk

Where can I get more information about the guideline?

The NICE website has the recommendations in full, reviews of the evidence they are based on, a summary of the guideline for patients and carers, and tools to support implementation (see inside back cover for more details).

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NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Contents

Patient-centred care

Treatment and care should take into account the individual needs and preferences of children with diarrhoea and vomiting, and those of their parents and carers. Good communication is essential, supported by evidence-based information, to allow parents and carers to reach informed decisions about their child's care. Follow Department of Health advice on seeking consent if needed.

Introduction

Diarrhoea and vomiting caused by gastroenteritis are common in children younger than 5 years. Severe diarrhoea and vomiting can lead to dehydration, which is serious, but gastroenteritis can usually be managed at home with advice from healthcare professionals. Diarrhoea usually lasts for 5–7 days and stops within 2 weeks. Vomiting usually lasts for 1–2 days and stops within 3 days.

Diarrhoea and vomiting are a significant burden on health services, and clinical practice varies. This guideline aims to reduce this variation and make the best use of NHS resources.

Key priorities for implementation

Diagnosis

- Perform stool microbiological investigations if:
  - you suspect septicaemia **or**
  - there is blood and/or mucus in the stool **or**
  - the child is immunocompromised.

Assessing dehydration and shock

- Use table 1 (see page 8) to detect clinical dehydration and shock.

Fluid management

- 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 (see box 2, page 7)
  - offer oral rehydration salt (ORS) solution as supplemental fluid to those at increased risk of dehydration (see box 2, page 7).
- In children with clinical dehydration, including hypernatraemic dehydration:
  - use low-osmolarity ORS solution (240–250 mOsm/l)[1] for oral rehydration therapy
  - give 50 ml/kg for fluid deficit replacement over 4 hours as well as maintenance fluid
  - give the ORS solution frequently and in small amounts
  - 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, page 8)
  - consider giving the ORS solution via a nasogastric tube if they are unable to drink it or if they vomit persistently
  - monitor the response to oral rehydration therapy by regular clinical assessment.
- Use intravenous fluid therapy for clinical dehydration if:
  - shock is suspected or confirmed
  - a child with red flag symptoms or signs (see table 1, page 8) shows clinical evidence of deterioration despite oral rehydration therapy
  - a child persistently vomits the ORS solution, given orally or via a nasogastric tube.

[1] The 'BNF for children' (BNFC) 2008 edition lists the following products with this composition: Dioralyte, Dioralyte Relief, Electrolade and Rapolyte.

- 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 both 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
  - consider providing intravenous potassium supplementation once the plasma potassium level is known.

Nutritional management

- After rehydration:
  - give full-strength milk straight away
  - reintroduce the child's usual solid food
  - avoid giving fruit juices and carbonated drinks until the diarrhoea has stopped.

Information and advice for parents and carers

- Advise parents, carers and children that[2]:
  - washing hands with soap (liquid if possible) in warm running water and careful drying are the most important factors in preventing the spread of gastroenteritis
  - hands should be washed after going to the toilet (children) or changing nappies (parents/carers) and before preparing, serving or eating food
  - towels used by infected children should not be shared
  - children should not attend any school or other childcare facility while they have diarrhoea or vomiting caused by gastroenteritis
  - children should not go back to their school or other childcare facility until at least 48 hours after the last episode of diarrhoea or vomiting
  - children should not swim in swimming pools for 2 weeks after the last episode of diarrhoea.

[2] This recommendation is adapted from the following guidelines commissioned by the Department of Health:
- Health Protection Agency (2006) Guidance on Infection Control In Schools and other Child Care Settings. London. Available from www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947358374
- Working Group of the former PHLS Advisory Committee on Gastrointestinal Infections (2004) Preventing person-to-person spread following gastrointestinal infections: guidelines for public health physicians and environmental health officers. Communicable Disease and Public Health 7(4):362–84.

Diagnosis

- Suspect gastroenteritis if there is a sudden:
  - change to loose or watery stools **or**
  - onset of vomiting.
- 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 **and**
  - recent travel abroad.
- Notify and act on the advice of the public health authorities if you suspect an outbreak of gastroenteritis.

Box 1 Any of the following may indicate diagnoses other than gastroenteritis:

- temperature of 38°C or higher (younger than 3 months)
- temperature of 39°C or higher (3 months or older)
- shortness of breath or tachypnoea
- altered conscious state
- neck stiffness
- bulging fontanelle (in infants)[3]
- non-blanching rash
- blood and/or mucus in stool
- bilious (green) vomit
- severe or localised abdominal pain
- abdominal distension or rebound tenderness.

Laboratory investigations

Perform stool microbiology if:	Consider performing stool microbiology if:
• you suspect septicaemia **or** • there is blood or mucus in the stool **or** • the child is immunocompromised.	• the child has recently been abroad **or** • the diarrhoea has not improved by day 7 **or** • you are uncertain about the diagnosis of gastroenteritis.

- If stool microbiology is performed:
  - collect, store and transport stool specimens as advised by the investigating laboratory
  - provide the laboratory with relevant clinical information.
- Perform a blood culture if giving antibiotic therapy.
- Seek specialist advice about monitoring for haemolytic uraemic syndrome in children with *Escherichia coli* O157:H7 infection.

[3] Infant: child younger than 1 year.

Assessing dehydration

- **Use table 1 on page 8 to detect clinical dehydration and shock during remote[4] and face-to-face assessments.**

Box 2 These children are at increased risk of dehydration:

- children younger than 1 year, especially those younger than 6 months
- infants who were of low birth weight
- children who have passed six or more diarrhoeal stools in the past 24 hours
- children who have vomited three times or more in the past 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.

- Suspect hypernatraemic dehydration if there are any of the following:
  - jittery movements
  - increased muscle tone
  - hyperreflexia
  - convulsions
  - drowsiness or coma.

Laboratory investigations

- Do not routinely perform blood biochemistry.
- Measure plasma sodium, potassium, urea, creatinine and glucose concentrations if:
  - intravenous fluid therapy (IVT) is required **or**
  - there are symptoms or signs suggesting hypernatraemia.
- Measure venous blood acid–base status and chloride concentration if shock is suspected or confirmed.

[4] Remote assessment: situation in which a child is assessed by a healthcare professional who is unable to examine the child because the child is geographically remote from the assessor.

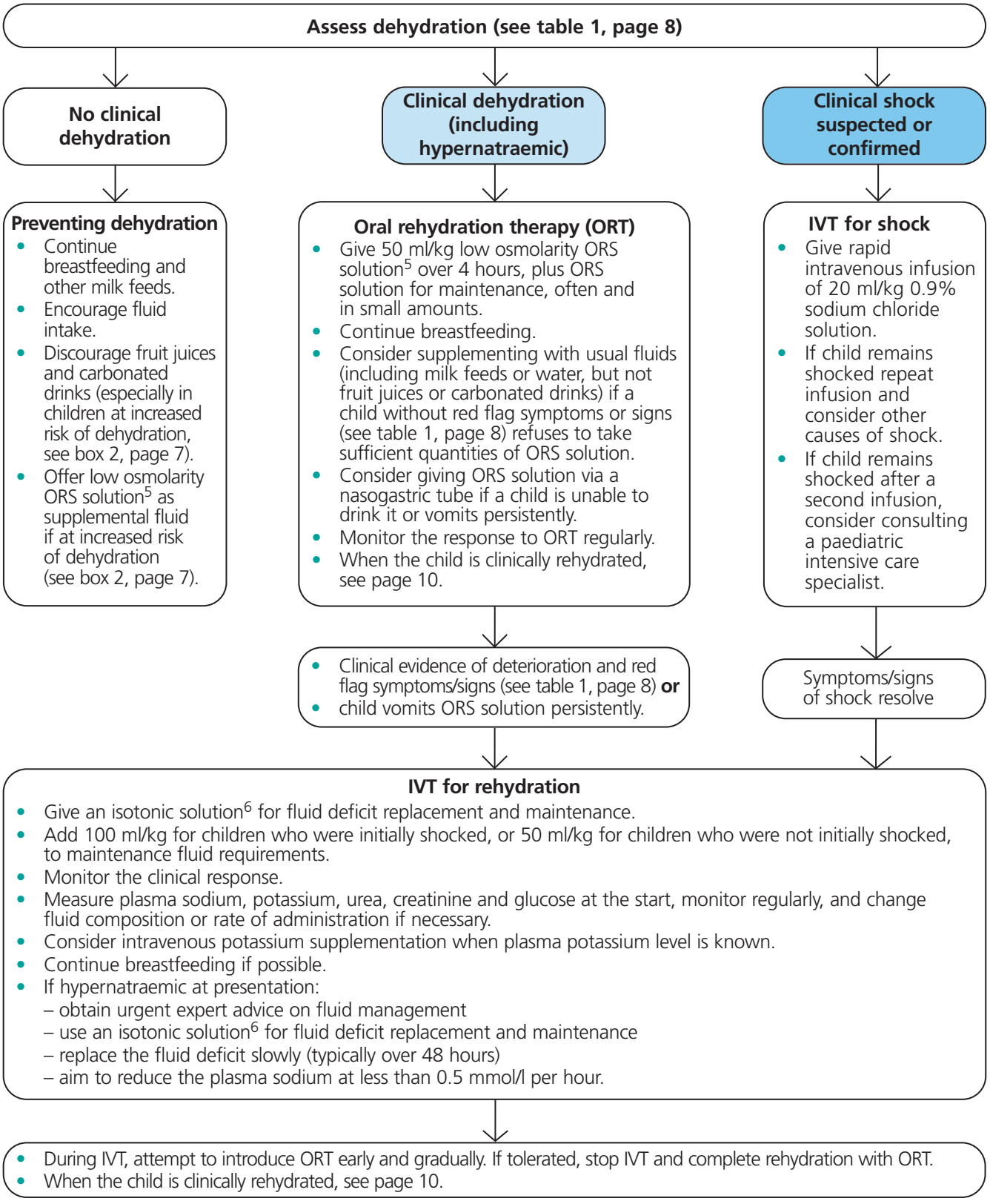
Table 1 Symptoms and signs of clinical dehydration and shock

Interpret symptoms and signs taking into account risk factors for dehydration (see box 2, page 7). 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 (indicates decompensated shock)

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.

Fluid management after rehydration

- Encourage breastfeeding, other milk feeds and fluid intake.
- Consider giving 5 ml/kg ORS solution after each large watery stool to:
  - children younger than 1 year (especially those younger than 6 months)
  - infants who were of low birth weight
  - children who have passed six or more diarrhoeal stools in the past 24 hours
  - children who have vomited three times or more in the past 24 hours.
- If dehydration recurs, start ORT again.

Nutrition

- During rehydration therapy:
  - continue breastfeeding
  - do not give solid foods
  - for children without red flag symptoms or signs (see table 1, page 8), do not routinely give oral fluids other than ORS solution; however, consider supplementing with usual fluids (including milk feeds or water, but not fruit juices or carbonated drinks) if they consistently refuse ORS solution
  - for children with red flag symptoms or signs (see table 1, page 8), do not give oral fluids other than ORS solution.
- After rehydration:
  - give full-strength milk straight away
  - reintroduce the child's usual solid food
  - avoid giving fruit juices and carbonated drinks until the diarrhoea has stopped.

Escalating care

Assessments	Who	Action
Remote and face-to-face	• Children with symptoms suggesting shock (see table 1, page 8)	• Arrange emergency transfer to secondary care
	• Children who will be managed at home or do not need to be referred	• Provide a 'safety net' (see page 14)
Remote	• Children who have symptoms suggesting an alternative serious diagnosis (see box 1, page 6) • Children who are at high risk of dehydration, taking into account the factors in box 2, page 7 • Children who have symptoms suggesting clinical dehydration (see table 1, page 8) • Children whose social circumstances make remote assessment unreliable	• Refer for face-to-face assessment
Face-to-face	• Children who have symptoms and/or signs suggesting an alternative serious diagnosis (see box 1, page 6) • Children with red flag symptoms or signs (see table 1, page 8) • Children whose social circumstances require continual involvement of healthcare professionals	• Consider a repeat face-to-face assessment or referral to secondary care

Antibiotics and antidiarrhoeals

- Do not give antidiarrhoeals.
- Do not routinely give antibiotics.
- Give antibiotics to 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.
- Seek specialist advice about antibiotic therapy for children who have recently been abroad.

Advice for parents and carers

Caring for a child with gastroenteritis at home

- Provide a 'safety net'. This should include:
  - information on how to recognise red flag symptoms (see table 1, page 8)
  - information on how to get immediate help if red flag symptoms develop
  - arrangements for follow-up at a specified time and place if necessary.
- Advise parents and carers:
  - that most children with gastroenteritis can be safely managed at home
  - that diarrhoea usually lasts for 5–7 days and stops within 2 weeks, and vomiting usually lasts for 1–2 days and stops within 3 days
  - how to recognise dehydration (see table 1, page 8)
  - about fluid and nutritional management (see pages 9–11)
  - how to care for their child after rehydration.
- Advise parents and carers to contact a healthcare professional if:
  - symptoms of dehydration develop
  - symptoms do not resolve as expected
  - their child refuses to drink ORS solution or persistently vomits.

Preventing the spread of gastroenteritis

- Washing hands with soap (liquid if possible) in warm running water and careful drying are the most important ways to prevent the spread of gastroenteritis.
- Hands should be washed after going to the toilet or changing nappies and before touching food.
- Towels used by children with gastroenteritis should not be shared.
- Children should not attend any school or other childcare facility while they have diarrhoea or vomiting caused by gastroenteritis.
- Children should not go back to school or other childcare facility until at least 48 hours after the last episode of diarrhoea or vomiting.
- Children should not swim in swimming pools for 2 weeks after the last episode of diarrhoea.

Further information

Ordering information

You can download the following documents from www.nice.org.uk/CG84

- The NICE guideline – all the recommendations.
- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- 'Understanding NICE guidance' – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or 'Understanding NICE guidance', phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N1844 (quick reference guide)
- N1845 ('Understanding NICE guidance').

Implementation tools

NICE has developed tools to help organisations implement this guidance (see www.nice.org.uk/CG84).

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see www.nice.org.uk

- Feverish illness in children: assessment and initial management in children younger than 5 years. NICE clinical guideline 47 (2007). Available from: www.nice.org.uk/CG47

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be available at www.nice.org.uk/CG84

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