



## CLINICAL PRACTICE GUIDELINE

### Management of Infant and Child Dehydration due to Diarrhea

CODE

WORKING DRAFT July 20, 2009

AUTHORIZED BY

EFFECTIVE DATE

REVISED DATE

PAGE

#### PURPOSE

The purpose of this guideline is to provide information to assist caregivers of infants and young children to assess and manage diarrhea. These guidelines apply to the following care providers in the Winnipeg Regional Health Authority (WRHA): public health nurses (PHN), nutritionists, nurse practitioners, pediatric outpatient facilities and primary care nurses.

#### GOALS

1. To prevent dehydration and facilitate hydration of infants and children with mild to moderate dehydration due to diarrhea.
2. To increase understanding of the symptoms of dehydration and facilitate earlier referral for medical assessment and intervention as necessary.
3. To ensure that caregivers have access to evidence-based information for infants and young children with diarrhea.

#### SCOPE

The target population is health providers who support individuals caring for infants and young children in community based settings. This could include but is not limited to individuals, families, daycares, schools, and other community agencies.

### 1. DEFINITIONS

#### 1.1 Diarrhea

Diarrhea in an infant or child is defined as having more bowel movements than is usual for them, with a consistency that is less formed and excessively watery.<sup>1,2,3</sup> The consistency of the stool is the most important indicator. For instance, the more frequent passage of formed stools is not considered to be diarrhea, and it is normal for breastfed babies to have stools of a pasty consistency.<sup>2</sup> Diarrhea may be associated with other symptoms including fever, nausea, vomiting, loss of appetite, stomach pains or cramps, as well as blood and/or mucus in the stool.<sup>1</sup>



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**1.2 Dehydration**

Dehydration develops when water and electrolyte losses are not adequately replaced.<sup>2</sup> Diarrhea is one factor contributing to increased loss of water and electrolytes that include sodium, chloride, potassium, and bicarbonate, from the body. Water and electrolytes are also lost during vomiting, sweating, urinating and breathing. The extent of the dehydration is dependent upon the amount of fluid loss. As indicated in Table A developed by the Nutrition Committee of the Canadian Paediatric Society, as fluid losses increase, signs and symptoms of dehydration become more severe.<sup>4</sup>

**Table A: Clinical Assessment of Degree of Dehydration**

Mild (under 5%)	Moderate (5-10%)	Severe (over 10%)
Slightly decreased urine output	Decreased urine output	Markedly decreased or absent urine output
Slightly increased thirst	Moderately increased thirst	Greatly increased thirst
Slightly dry mucous membranes	Dry mucous membranes	Very dry mucous membranes
Slightly elevated heart rate	Elevated heart rate	Greatly elevated heart rate
	Decreased skin turgor	Decreased skin turgor
	Sunken eyes	Very Sunken eyes
	Sunken anterior fontanelle	Very sunken anterior fontanelle
		Lethargy
		Cold extremities
		Hypotension
		Coma

*\*Some of these signs may not be present*

**1.3 Oral Rehydration Solutions (ORS)**

Oral rehydration solutions are mixtures of glucose, salts, and water.<sup>1,2</sup> The solution is easily absorbed in the small intestine, even during times of severe diarrhea, and restores the electrolyte balance that is lost in the feces.<sup>2</sup> ORS solutions can be purchased at pharmacies and many grocery stores, and are one component of home therapy to treat diarrhea and prevent dehydration of infant and young children.<sup>1,2,3,4</sup> ORS's are sold as powders that require reconstitution, in



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“Ready to Serve” preparations, and as popsicles.<sup>1</sup> Common brand names include Pedialyte, Gastrolyte and Enfalyte.

**RECOMMENDATIONS FOR CARE, as outlined by the Canadian Paediatric Society**

**1. Management of Diarrhea in Infants and Young Children**

- 1.1. Contact your primary health care provider if your baby is less than 6 months of age or if your child is older than 6 months and has any co-existing health conditions
- 1.2. If your child breastfeeds, feed on demand and offer other foods normally eaten.
- 1.3. If your child is formula feeding, continue to offer the formula in addition to other foods your child normally takes.
- 1.4. If your child is not breastfeeding or formula feeding well, the CPS recommends ORS according to Table B

**Table B.: Recommended Amount of ORS based on Age (CPS)**

First four hours	Recovery Stage
<p><b>Six months and under</b></p> <ul style="list-style-type: none"> <li>• 30 to 90 ml ORS (1 to 3 oz.) every hour (parent must have consulted with physician or other primary health care provider)</li> </ul>	<p><b>4-24 Hours</b></p> <ul style="list-style-type: none"> <li>• Offer ORS until diarrhea is less frequent</li> <li>• As vomiting decreases, reintroduce usual diet in small frequent feedings</li> </ul> <p><b>After 24-48 hours</b></p> <ul style="list-style-type: none"> <li>• Most children should be able to resume their normal diet.</li> </ul>
<p><b>Six to 24 months</b></p> <ul style="list-style-type: none"> <li>• 90 to 125 ml ORS (3 to 4 oz.) every hour</li> </ul>	
<p><b>2 years and older</b></p> <ul style="list-style-type: none"> <li>• 125 to 250 ml ORS (4 to 8 oz.) every hour</li> </ul>	



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**2. Caregiver Education**

- 2.1 It is important for infants and children with diarrhea to drink the proper volume of fluids to prevent dehydration. Give small amounts of ORS often (for example, 1 teaspoon every 5 minutes), gradually increasing the amount until your child can drink normally.
- 2.2 ORS may be provided by teaspoon, syringe, medicine dropper or bottle. Caregivers may require education or assistance in determining the most appropriate method to offer ORS to their child.
- 2.3 It may take 7 - 10 days or longer for the child's stool to return to their normal consistency. The number of stools may increase at first (1 or 2 more per day).
- 2.4 The following foods can worsen diarrhea and should be avoided:
  - 2.31 Plain water
  - 2.32 Sugary drinks such as fruit juices, sweetened fruit drinks, or sports drinks
  - 2.33 Carbonated drinks such as pop/soda
  - 2.34 Sweetened teas
  - 2.35 Broths, rice water, or other clear fluids
- 2.5 The most important methods of preventing the spread of germs causing diarrhea are thorough hand washing and safe food handling.
- 2.6 Occasionally, healthy children spit up, vomit or have loose stools, without danger of dehydration.
- 2.7 Diarrhea that lasts longer than 1 to 2 weeks is considered chronic and caregivers should consult their primary health provider.

**3. Referral For Medical Assessment**

- 3.1 Parents should be instructed to advise their primary caregiver or seek follow-up at Children's Hospital immediately if the child has:
  - 3.11 Diarrhea and is less than 6 months of age
  - 3.12 Bloody or black stools
  - 3.13 Continued vomiting after 4 to 6 hours of ORS therapy
  - 3.14 Diarrhea and fever higher than 38.5°C (101.5°F)
  - 3.15 Stomach pains that are worsening
  - 3.16 Signs of moderate or severe dehydration per Table 1



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## VALIDATION

Diarrhea is common in babies and young children.<sup>1</sup> It is generally mild and transient, and classified as “acute” when duration is less than 1 week.<sup>3</sup> Diarrhea in infants and young children can result in significant morbidity and mortality however.<sup>2,3</sup> It is the cause of millions of deaths in developing countries; and a primary reason for emergency room and physician visits in developed countries, as well as parental absences from work.<sup>3</sup>

Generally, children do not develop significant dehydration as a result of diarrhea, and can be cared for at home.<sup>3</sup> It is important for health professionals to be knowledgeable and able to teach caregivers about diarrhea and its management, particularly when to seek medical consultation. A CPG on diarrhea and dehydration assists health providers to offer accurate information, and deliver safe and effective care to the public.<sup>5</sup>

## EVIDENCE

There are a variety of universal causes of diarrhea. These germs tend to spread easily among children, particularly before they are toilet trained.<sup>1</sup> Typically, acute gastroenteritis in infants and children results from viral infections, which are not treatable with antibiotics.<sup>3</sup> The most common is rotavirus in children age 6 months – 2 years.<sup>1,3</sup> Initial symptoms are high fever and vomiting, followed by large amounts of watery diarrhea within 12-24 hours. Illness usually subsides within 3-7 days. In Canada, outbreaks of rotavirus tend to occur between December and May.<sup>1</sup> Other common causes of diarrhea in children include food poisoning, parasites such as *Giardia*, and bacteria such as *Campylobacter*, *Salmonella*, *Shigella* and *E. coli*.<sup>1</sup> Although certain bacterial diarrheas are treatable with antibiotics, children often begin to get better before the type of bacteria is identified and the appropriate course of antibiotic initiated.<sup>3</sup>

The management and treatment of diarrhea in infants and children has several goals. The main objectives are to prevent dehydration, to reduce the severity and duration of the diarrhea, to refer for medical treatment when necessary, and to promote optimal nutrition throughout the course of illness.<sup>2</sup> When diarrhea is not responded to appropriately, infants and children are at high risk to develop the more serious consequences associated with dehydration. Dehydration is treatable with fluid therapy (oral and IV), but foremost, is preventable.<sup>3</sup> Health professionals play critical roles in prevention, encouraging breastfeeding, and providing education about personal practices and food handling that can reduce the spread of germs that cause diarrhea.<sup>1,2,3</sup>



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## **Appendix 1, Health information for parents**

Retrieved from: <http://www.caringforkids.cps.ca/whensick/Dehydration&Diarrhea.htm>



### **Dehydration and diarrhea in children: Prevention and treatment**

#### **What are the symptoms of dehydration?**

Dehydration is caused by a loss of body fluids, which are made up of water and salts. When sick children have diarrhea or are vomiting, they can lose large amounts of salts and water from their bodies and can become dehydrated very quickly.

Dehydration can be very dangerous, especially for babies and toddlers. Children can even die if they are not treated.

#### **What are the signs of dehydration?**

#### **Call your child's doctor or seek medical advice if you see signs of dehydration:**

- decreased urination (fewer than 4 wet diapers in 24 h),
- increased thirst,
- no tears,
- dry skin, mouth and tongue,
- faster heart beat,
- sunken eyes,
- grayish skin,
- sunken soft spot (fontanelle) on baby's head.

Healthy children can spit up, vomit or have a loose stool once in a while without being in danger of dehydrating.

#### **What are the symptoms of diarrhea?**

Diarrhea is a very common problem in babies and children. It is usually mild and brief. "Acute" diarrhea lasts less than 1 week.

A child has diarrhea if she has more bowel movements than usual, and if stools are less formed and more watery than usual. Sometimes children with diarrhea have other symptoms, such as [fever](#), loss of appetite, nausea, vomiting, stomach pains, cramps, and blood and/or mucus in the bowel movement.

Diarrhea can be dangerous if not treated properly because it drains water and salts from your child. If these fluids are not put back quickly, your child may become dehydrated and may need to be hospitalized.

#### **How diarrhea spreads**

Diarrhea germs are easily spread from person to person, and especially from child to child. They usually spread quickly among children who have not learned to use the toilet.

### **What causes diarrhea?**

There are many different possible causes of diarrhea. The most common are:

- Viruses, such as rotavirus, which can't be treated with [antibiotics](#).
- Bacteria, such as *Campylobacter*, *Salmonella*, *Shigella* and *E. coli*. Some bacterial diarrhea can be treated with antibiotics, but children usually start to get better before the bacteria are identified.
- Food poisoning.
- Parasites, such as [Giardia](#).

### **Rotavirus**

Rotavirus is the most common cause of acute diarrhea in babies and young children. It usually affects children between the ages of 6 months and 2 years.

Rotavirus illness starts between 12 hours and 4 days after being exposed to the germ. The first signs are usually a high fever (40°C/104°F) and vomiting. Within 12 to 24 hours, children start to pass large amounts of watery diarrhea. The illness usually lasts 3 to 7 days.

When children have rotavirus, their stools contain large numbers of germs. Rotavirus can spread directly (such as by coming in contact with an infected diaper and not washing hands properly afterward), or indirectly (for example, coming in contact with a toy that has germs on it).

Outbreaks of rotavirus in Canada usually happen in the winter and spring, between December and May. A vaccine to prevent rotavirus is available in Canada.

### **How to prevent diarrhea**

Proper [handwashing](#) and safe [food handling](#) are the most important ways to prevent the spread of germs that cause diarrhea.

### **How to treat diarrhea**

Children with diarrhea need to keep drinking the right amount of fluids to avoid dehydration.

### **Oral rehydration solutions**

An oral rehydration solution (ORS) is an exact mixture of water, salts and sugar. These solutions can be absorbed even when your child is vomiting. The key is to give small amounts of ORS often (for example, 1 teaspoon every 5 minutes), gradually increasing the amount until your child can drink normally.

Oral rehydration solutions are available at pharmacies in ready-to-serve preparations, frozen popsicles and powders.

Although powders are cheaper and easier to store, they have to be mixed very carefully to work properly. It is better to buy an ORS that has already been mixed.

Oral rehydration solutions can be used to:

- keep children well hydrated when their diarrhea is serious.
- put back fluids when children show signs of mild dehydration.

**If you are [breastfeeding](#)**, keep feeding on demand. You can also offer your child the foods he usually eats.

**If you are formula feeding**, you don't need to dilute the formula. Continue formula feeding, and



offer your child the food he normally eats.

If your child is not breastfeeding or formula feeding well, offer ORS as follows:

#### **For the first 4 hours**

- For babies 6 months and younger: give 30 to 90 mL (1 to 3 oz.) every hour.
- At 6 to 24 months: give 90 to 125 mL (3 to 4 oz.) every hour.
- Children over 2 years of age: give 125 to 250 mL (4 to 8 oz.) every hour.
- If an infant refuses the ORS by the cup or bottle, give the solution using a medicine dropper, small teaspoon or frozen popsicles.
- If a child vomits, you may need to stop giving food and drink. But continue to give the ORS using a spoon. Give 15 mL (1 tbsp.) every 10 min to 15 min until the vomiting stops. Increase the amounts gradually until your child is able to drink the regular amounts. **If vomiting does not stop after 4 to 6 hours, take your child to the hospital.**

#### **After 4 hours until 24 hours: Recovery stage**

- Keep giving your child the oral rehydration solution until diarrhea is less frequent.
- When vomiting decreases (and depending on your child's age), it is important to start your child breastfeeding as usual (or drinking formula or whole milk) or eating regular food in small, frequent feedings.

After 24 to 48 hours, most children can resume their normal diet.

Stools may increase at first (1 or 2 more each day). It may take 7 to 10 days or longer for stools to become completely formed. This is part of normal healing in a child's bowel system (intestine).

#### **Foods to avoid**

**Do not** give your child sugary drinks such as: fruit juice or sweetened fruit drinks, carbonated drinks (pop/soda), sweetened tea, broth or rice water. **These have the wrong amounts of water, salts and sugar** and can make your child's diarrhea worse.

If your child is having frequent diarrhea, do not offer plain water. Drinking only water may lead to low blood sugar or low sodium levels in your child's blood.

Talk to your doctor before giving [over-the-counter medications](#) to stop diarrhea.

#### **When to call the doctor?**

- Your child has diarrhea and is less than 6 months of age.
- Your child has bloody or black stools.
- Your child is still vomiting after 4 to 6 hours.
- Your child has diarrhea and a [fever](#) with a temperature higher than 38.5°C (101.5°F).
- Your child has signs of dehydration (as listed above)
- Your child has stomach pains that are getting worse.

Diarrhea lasting for more than 1 to 2 weeks is considered chronic. Talk to your child's doctor if this is the case.

**Reviewed by the CPS Public Education Subcommittee**


**Reviewed: February 2008**

This information should not be used as a substitute for the medical care and advice of your physician. There may be variations in treatment that your physician may recommend based on individual facts and circumstances.

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Also available at [www.caringforkids.cps.ca](http://www.caringforkids.cps.ca)

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