Oral Rehydration Therapy (ORT) in Children

Effective Date: September 1, 2010

Scope

This guideline addresses the oral rehydration of children age 6 months to 17 years with mild to moderate dehydration as the result of suspected gastroenteritis.

Inclusion Criteria:

- Children aged 6 months to 17 years old presenting with either vomiting and/or diarrhea fewer than 7 consecutive days, resulting in mild to moderate dehydration.

Exclusion Criteria:

- Children presenting with: severe dehydration (unstable vital signs, poor perfusion)
- Altered level of consciousness (Glasgow Coma Score <15)
- Persistent lethargy or acute head injury
- Possible surgical abdomen (bloody or bilious vomiting, bloody diarrhea, abdominal distension & tense, absent bowel sounds, guarding or rigidity and right lower quadrant pain),
- Chronic health conditions (such as Gastric or Jejunal feeding tubes dependence, known inflammatory bowel disease, known immunodeficiency syndrome, known metabolic disorders, insulin dependent diabetes, heart or renal disorder and neurosurgical history).

Diagnosis/Investigation

Assessing Dehydration in Children

When a child presents with symptoms of gastroenteritis, whether in the clinic/office or Emergency Department (ED), one of the main roles is to assess the child's hydration status and then decide on the appropriate management. Loss of body weight during the illness is the gold standard for measuring the magnitude of dehydration; however, the pre-illness weight may not be available.

Table 1. Clinical assessment of degree of dehydration[1]

Degree of dehydration	Mild (5-7% body weight)	Moderate (7-9% body weight)	Severe (>10% body weight)
Fontanelle	Slightly sunken	Very sunken	Very sunken
Mucous membranes	Slightly sticky	Dry	Very dry
Skin turgor	Normal	Slightly decreased	Markedly decreased
Capillary refill time	Normal (<3 seconds)	Normal (<3 seconds)	Delayed (≥3 seconds)
Urine output	Normal	Slightly decreased	Decreased or absent
Mental status	Normal	Slightly fussy	Irritable or lethargic

Based on the degree of dehydration, the following approach to management has been suggested:

Table 2. Management of Dehydration[1]

Degree of dehydration	Management
Mild	Home-based treatment - see Parent Education and Resources
Moderate	Oral rehydration for 1 hour, then reassess • post-reassessment if normal discharge home, • If dehydration still moderate: continue oral rehydration • Reassess, if concerned do bloodwork - give 20 mL/kg bolus IV fluids over 1 hour, check pH, bicarbonate, nitrogen, discharge after bolus if improved but if pH < 7.32, bicarb < 18: Admit patient, administer intravenous fluids (IV)
Severe	Admit patient, do bloodwork - give 20 mL/kg bolus IV fluids over 1 hour, check pH, bicarbonate, nitrogen. Continue IV as required.

Management of Rehydration

Acute gastroenteritis is one of the most common causes of dehydration affecting infants and children. Oral rehydration therapy is replacement of fluids and electrolytes, such as sodium, potassium, and chloride necessary for normal physiological functions and is effective in 95% of cases of mild to moderate dehydration. Oral rehydration therapy is less invasive, less expensive, is associated with less morbidity and can be dispensed outside of the hospital setting, while being as effective as IV treatment.[5,6,7]

There is insufficient evidence to recommend the regular use of sports drinks for oral rehydration therapy in pedatric patients. The osmolarity and electrolyte concentrations of sports drinks can vary widely and may result in imbalances such as hypokalemia.[2,3,4]

Oral rehydration solutions are available in ready-to-serve preparations.

Table 3. Oral rehydration solutions

Recommended	Not Recommended (See Rationale)
• Electrolytes e.g. Pedialyte®, Enfalyte® • Gastrolyte powder • Breastmilk	• Tea • Sugar drinks (e.g. Apple juice, carbonated soft drinks) • Sports drinks (e.g. Gatorade®) • Homemade remedies

Rationale

Acute gastroenteritis is one of the most common illnesses causing mild and moderate dehydration in infants and children. In developed countries, the average child under 5 years of age experiences 2.2 episodes of diarrhea per year, whereas children attending day care centres may have even higher rates of diarrhea. These episodes result in large numbers of pediatric office and ED visits. In the United States, treatment for dehydration as a result of acute gastroenteritis accounts for an estimated 200,000 hospitalizations and 300 deaths per year, with comparable rates occurring in Canada.[8] Annually, costs of medical and non medical factors related to gastroenteritis in the United States are $600 million to $1.0 billion.[9]

Medical associations and international humanitarian organizations such as the Canadian Paediatric Society (CPS), American Academy of Pediatrics (AAP), and the World Health Organization (WHO) have stressed the importance of consistent treatment protocols for the treatment of mild to moderate dehydration. These protocols, based on scientific evidence, emphasize the safety and effectiveness of oral rehydration therapy in cases of mild and moderate dehydration. *Despite these recommendations and compelling evidence supporting the use of oral rehydration therapy, it remains underused.* Some of the factors contributing to under use of oral

rehydration therapy include: physicians' lack awareness of AAP and CPS gastroenteritis guidelines; perception of barriers to the use of oral rehydration therapy; and variation in overall practice pattern.[10,11] This has resulted in highly inconsistent quality of care for gastroenteritis causing dehydration.

Implementation of an ED oral rehydration therapy clinical pathway for mild to moderate dehydration in children may help promote consistent evidence based practice and improvement in quality of care.[12]

Use of Antiemetics:
A recent Cochrane review found limited evidence favouring the use of ondansetron over placebo to reduce the number of episodes of vomiting due to gastroenteritis in children.[13] Freedman et al. suggest that a single dose of oral ondansetron may be well suited for use in the emergency department to reduce vomiting and facilitate oral rehydration therapy.[14] Therefore, while the use of antiemetics may be beneficial in some patients, there is limited evidence to recommend their routine use. It may be reasonable to try ondansetron to facilitate oral rehydration therapy prior to IV treatment. Consult with local formularies and local hospital policy for the use of medication.

References

1 Goldman R, Friedman JN, Parkin PC, Validation of the clinical dehydration scale for children with acute gastroenteritis. Pediatrics. 2008;122:545-549.

2 Oral rehydration Salts. Department of Child and Adolescent Health and Development (CAH) World Health Organization. WHO/FCH/CAH/06.1

3 Rao SSC, Summers, RW, Rao GRS, et al. Oral rehydration for viral gastroenteritis in adults: a randomized, controlled trial of 3 solutions. J Parenteral Enteral Nutrition. 2006;30(5):433-439.

4 Nutrition Committe, Canadian Paediatric Society. Oral rehydration therapy and early refeeding in the management of childhood gastroenteritis. Paediatr Child Health. 2006;11(8):527-31.

5 Hartling L, Bellemare S, Wiebe N. et al. Oral versus intravenous rehydration for treating dehydration due to gastroenteritis in children. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.:CD004390. DOI:10.1002./14651858.CD004390.pub2.

6 Armon K, Stephenson T, MacFaul R, et al. An evidence and consensus based guideline for acute diarrhoea management. Arch Dis Child. 2001 Aug;85(2):132-142.

7 Nutrition and gastroenterology committee. Oral rehydration therapy and early refeeding in the management of childhood gastroenteritis. A CPS position statement. Pediatrics & child health 2006;11(8):527.

8 Nutrition Committee, Canadian Paediatric Society (CPS). Oral rehydration therapy and early refeeding in the management of childhood gastroenteritis. The Canadian Journal of Paediatrics. 1994;1(5): 160-164.

9 Avendano P, Matson DO, Long J, et al. Costs associated with office visits for diarrhea in infants and toddlers. Pediatr Infect Dis J. 1993 Nov;12(11):897-902.

10 Guandalini S. Treatment of acute diarrhea in the new millennium. Journal of Pediatric Gastroenterology & Nutrition 2000. May;30(5):486-489.

11 Ozuah PO, Avner JR, Stein RE. Oral rehydration, emergency physicians, and practice parameters: a national survey. Pediatrics. 2002 Feb;109(2):259-261.

12 Jones S. A clinical pathway for pediatric gastroenteritis. Gastroenterology Nursing. 2003 Jan-Feb;26(1):7-18.

13 Alhashimi D, AL-Hashimi F, Fedorowicz. Antiemetics for reducing vomiting related to acute gastroentereitis in children and adolescents. Cochrane Database of Systematic Reviews 20009, Issues 2. Art. Not.:CD005506. DOI: 10.1002/14651858.CD005506.pub4.

14 Freedman SB, Alder M, Seshadri R, et al. Oral ondansetron for gastroenteritis in a pediaric emergency department. N Engl J Med. 2006;354:1698-705.

Resources

HealthlinkBC: www.HealthlinkBC.ca
In BC dial 8-1-1 for easy access to non-emergency health information and services. TTY (deaf and hearing-impaired) call 7-1-1. Translation services are available in over 130 languages on request.

This guideline is based on scientific evidence current as of the Effective Date.

This guideline was developed by the BC Children's Hospital, Child Health BC, and the Guidelines and Protocols Advisory Committee, in collaboration with the Provincial Health Services Authority (PHSA). The guideline was approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

Appendices

Appendix A: Flow Chart of Emergency Management of Dehydration

Associated Documents

Pediatric Dehydration: Sample Physician Orders CTAS Level 2 or 3
Parent Education and Resources

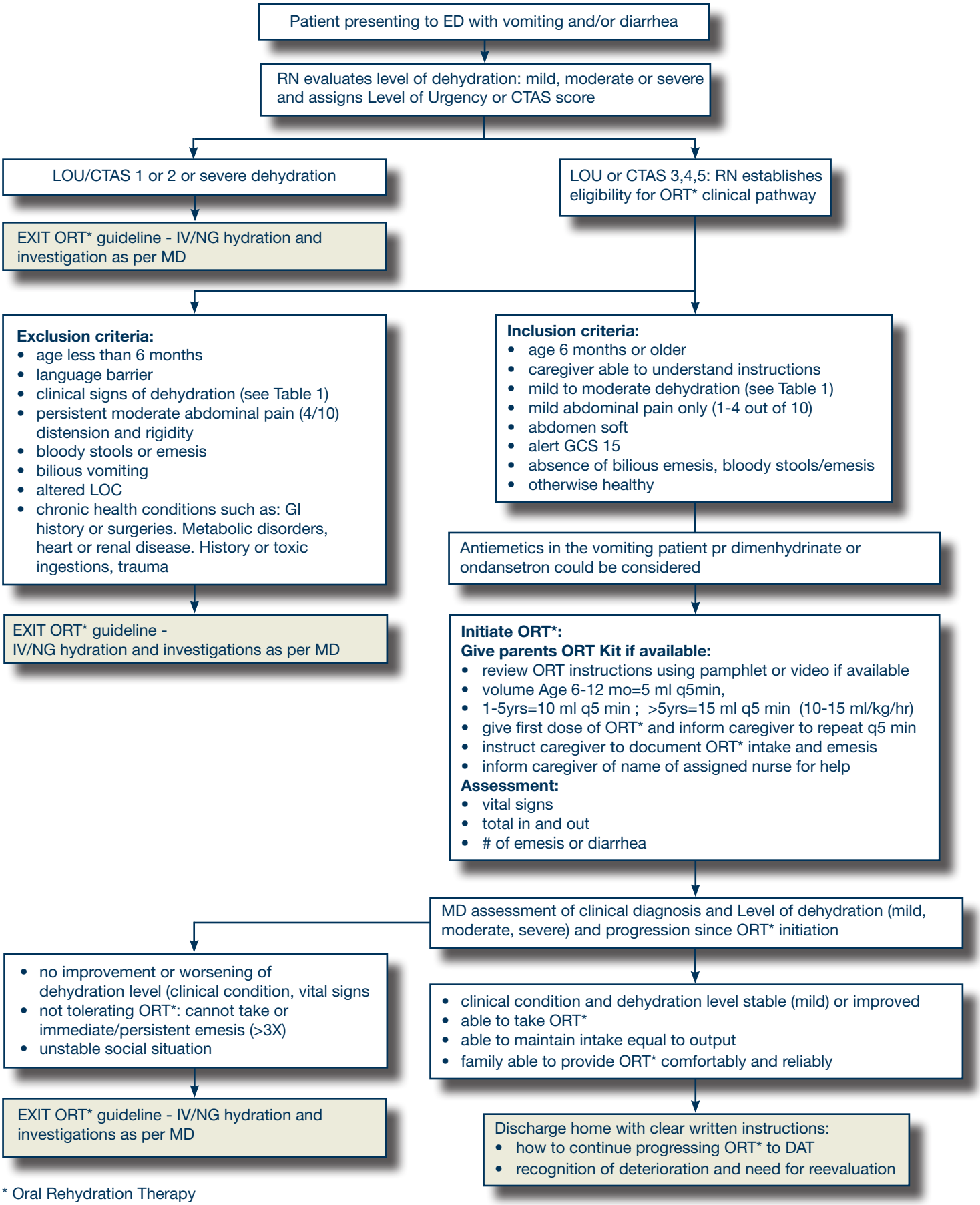
The principles of the Guidelines and Protocols Advisory Committee are to:

- encourage appropriate responses to common medical situations
- recommend actions that are sufficient and efficient, neither excessive nor deficient
- permit exceptions when justified by clinical circumstances

Contact Information

Guidelines and Protocols Advisory Committee
PO Box 9642 STN PROV GOVT
Victoria BC V8W 9P1
Phone: 250 952-1347
Fax: 250 952-1417
E-mail: hlth.guidelines@gov.bc.ca
Web site: www.BCGuidelines.ca

Appendix A: Flow Chart of Emergency Management of Dehydration



* Oral Rehydration Therapy

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PARENT EDUCATION AND RESOURCES

Oral Rehydration Therapy

Diarrhea and throwing up (vomiting) are common in children. Diarrhea usually lasts two to three days, but can last up longer. Throwing up usually settles quickly, lasting a day or two.

What Can I Do at Home to Make my Child More Comfortable?

- If your child has a fever or is cranky, give acetaminophen (Tylenol® or Tempra®) or ibuprofen (Advil® or Motrin®) - follow instructions on the bottle (if your child cannot take oral medication, suppositories can be obtained from a pharmacist)
- Continue with small amounts (sips) of fluid even if diarrhea or vomiting continues
- If your child is hungry, give regular food
- If breastfeeding, offer smaller feeds more often
- If bottle feeding, continue normal strength formula
- Give small amounts of fluid often
- Recommended drinks and amounts:
  - Electrolytes (e.g. Pedialyte® or Gastrolyte® (can be purchased at any pharmacy)
  - Watered-down sugar-free fruit juice (1 cup of juice to 4 cups of water)

What Should I Watch For?

Vomiting and diarrhea can lead to dehydration. Signs your child may be dehydrated are:

- More sleepy than usual
- Dry lips, tongue, and mouth
- Cold hands and feet
- Not passing urine (dry diapers)
- No tears when crying

When Should I Seek Medical Care?

You should seek medical care if your child:

- Has not passed urine in 12 hours
- Is unusually sleepy, restless, or cranky
- Has signs of dehydration (listed above)
- Has mucous or blood in diarrhea
- Refuses to drink and continues to have diarrhea or vomiting
- Continues to drink but vomits and is unable to keep fluids down
- **Try to keep your child away from other children until diarrhea has stopped**
- **If your child wants to drink more, that is okay - give small amounts each time**
- **Large amounts of fluid can make diarrhea and vomiting worse**

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