

Acute Gastroenteritis with Vomiting and/or Diarrhea Algorithm

Emergency Department



Last update: 10.16.19 KH

INCLUSION

Vomiting and/or diarrhea of recent onset not due to chronic disease, with or without fever, nausea, abdominal pain

EXCLUSION

- Patient < 2 months of age
- Vomiting with no diarrhea for >48 hrs
- Severe dehydration, toxic appearance or meets sepsis criteria
- Comorbid conditions (medically complex children, renal failure, cardiac disease, IBD, liver disease, VP shunt, short gut syndrome, myocarditis)
- ICU admission for similar symptoms
- Bilious emesis (consider bowel obstruction)
- Acute surgical abdomen
- Head injury within 72 hours

ORT FLUID

Pedialtye/Enfalyte Gatorade Diluted Apple Juice Breastmilk

Child presents to the ED with vomiting ED Nurse administers Zofran (Ondansetron) at intake if patient meets criteria for RN Initiated Zofran: Age > 6 months Weight > 8kg Zofran Dosing: Nausea/non-bilious emesis 8-15kg: 2mg ODT x 1 >=3 emesis episodes in last 24 hrs **15-30kg:** 4mg ODT x 1 No prior allergy to Zofran >30kg: 8mg ODT x 1 No past chronic medical history except asthma • No meds taken in the last 24 hrs EXCEPT Acetaminophen or Ibuprofen No head trauma within 72 hours, congenital prolonged QT, malignant hyperthermia reaction, muscle disorder Not tolerating PO liquids/solids since last emesis Does Patient Meet Criteria for Gastroenteritis CCG? YES **Determine Dehydration Severity** Vital Signs History and Physical Exam **Dehydration Assessment Tool Minimal Dehydration** Severe Dehydration **Moderate Dehydration** Administer Zofran if clinically **Off Pathway** PO Challenge/PO Trial indicated and not already Pedialtye/Enfalyte received at intake Gatorade Obtain IV access and order labs Popsicle **Reference IVF Management Diluted Apple Juice Algorithm in Weblink as needed **Oral Rehydration Therapy** Breastmilk (ORT) Fail Oral Fail ORT (Tool available here) Challenge Administer 1st IV fluid bolus 0.9% NS 20 ml/kg over **Initiation Phase of ORT** 30-60 min(max dose 1,000 ml) <10kg: 5ml q 5 mins ≥10kg: 10ml q 5 mins Assess in 30 min Reassess **IMPROVED** Pass Oral Challenge Second Phase of ORT Recheck vital signs <10kg: 10ml q 5 mins Review electrolytes ≥10kg: 20ml q 5 mins NOT IMPROVED Assess in 30-60 min Administer 2nd IV fluid bolus **TOLE RATES** 0.9% NS 20 ml/kg over 30-60 min (max dose 1,000 ml) Are Discharge/Home Management Criteria Met? Clinical status improved (1 or more urine output) Reassess Adequate family teaching Recheck vital signs Follow up established Review electrolytes NO **NOT IMPROVED** Send home with instructions and follow-up care Consider Alternative Diagnosis and Admit

A nonrandomized prospective study by Bailey et al. (2010) validates the use of the CDS for the prediction of LOS in the ED (after being seen by a physician) in patients 4 months to 4 years of age with gastroenteritis. A nonrandomized prospective study by Goldman et al. (2008) validates the use of the CDS in pediatric patients with AGE assessed in the ED to aid in predicting requirements for IV fluid rehydration and hospital LOS. The study finds that a higher CDS score is associated with an increased requirement for IV fluid rehydration and longer hospital LOS, but that there is no association between the CDS score and level of serum bicarbonate or pH level.

To obtain total CDS score, choose the most-appropriate characteristic related to each clinical feature. The sum of the 4 scores will determine the level of dehydration. For example, general appearance thirsty = 1; eyes slightly sunken = 1, mucous membranes (tongue) sticky = 1, tears absent = 2; total CDS score = 5 (moderate-to-severe dehydration).

Clinical Features	Characteristic and Score (choose 1 for each clinical feature; sum of scores = total CDS score)	
General Appearance	0 = Normal 1 = Thirsty, restless, lethargic but irritable when touched 2 = Drowsy, limp, cold, or sweaty, comatose or not	
Eyes	0 = Normal 1 = Slightly sunken 2 = Very sunken	
Mucous membranes (tongue)	0 = Moist 1 = Sticky 2 = Dry	
Tears	0 = Present 1 = Decreased 2 = Absent	

Total CDS Score: 0 = no dehydration; 1-4 = some dehydration; 5-8 = moderate-to-severe dehydration.

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Non-Bacterial Gastroenteritis Algorithm

Emergency Department



Evidence

General

Guarino A, Albano F, Ashkenazi S, Gendrel D, Hoekstra J. H, Shamir R, Szajewska H. The ESPGHAN/ESPID Guidelines for the Management of Acute Gastroenteritis in Children in Europe: J Pediatr Gastroenterol Nutr 2008: 6;619-21.[5a]

Harris C, Wilkinson F, Mazza D et al. Evidence-based guidelines for the management of diarrhea with or without vomiting in children. Aust Fam Physician. 2008;37:22-9. Full text at http://www.mihsr.monash.org/hfk/pdf/diarrhoea-sh-infect-cont-20051122.pdf [5a]

Hydration Assessment

Freedman SB1, Vandermeer B2, Milne A2, Hartling L2; Pediatric Emergency Research Canada Gastroenteritis Study Group. Diagnosing clinically significant dehydration in children with acute gastroenteritis using noninvasive methods: a meta-analysis. J Pediatr. 2015 Apr;166(4):908-16.e1-6. doi: 10.1016/j.jpeds.2014.12.029. Epub 2015 Jan 29.

Falszewska A, Szajewska H, Dziechciarz P. Diagnostic accuracy of three clinical dehydration scales: a systematic review. Archives of Disease in Childhood, 2018;103:383-388.

Jauregui J1, Nelson D2, Choo E2, Stearns B3, Levine AC2, Liebmann O2, Shah SP. External validation and comparsion of three pediatric clinical dehydration scales. PloS One. 2014. May 2;9(5):e95739. doi: 10.1371/journal.pone.0095739. eCollection 2014.

Steiner MJ1, DeWalt DA, Byerley JS. Is this child dehydrated? JAMA. 2004 Jun 9;291(22):2746-54

Maintenance IV Fluid

Alves JT1, Troster EJ, Oliveira CA. Isotonic saline solution as maintenance intravenous fluid therapy to prevent acquired hyponatremia in hospitalized children. J Pediatr (Rio J). 2011 Nov-Dec;87(6):478-86.doi:10.2223/JPED.2133.

Friedman JN1, Beck CE1, DeGroot J1, Geary DF2, Sklansky DJ3, Freedman SB4. Comparison of isotonic and hypotonic intravenous maintenance fluids: a randomized clinical trial. JAMA Pediatr. 2015 May;169(5):445-51. doi: 10.1001/jamapediatrics.2014.3809

Wang J1, Xu E, Xiao Y. Isotonic versus hypotonic maintenance IV fluids in hospitalized children: a meta-analysis. Pediatrics. 2014 Jan;133(1):105-13. doi: 10.1542/peds.2013-2041. Epub 2013 Dec 30.

Padua AP1, Macaraya JR, Dans LF, Anacleto FE Jr. Isotonic versus hypotonic maintenance IV fluids in hospitalized children: a meta-analysis. Pediatr Nephrol. 2015 Jul;30(7):1163-72. doi: 10.1007/s00467-014-3033-y. Epub 2015 Jan 11.

Probiotic

Freedman SB, Williamson-UrquhartS, Farion KJ, et al. Multicenter Trial of a Combination Probiotic for Children with Gastroenteritis. N Engl J Med 2018; 379:2015-2026. doi: 10.1056/NEJMoal802597

Schnadower D, Tarr PI, Charles CT, et al. Randomised controlled trial of *Lactobacillus rhamnosus* (LGG) versus placebo in children presenting to the emergency department with acute gastroenteritis: the PECARN probiotic study protocol. BMJ Open2017;7:e018115. doi:10.1136/bmjopen-2017-018115

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